GETRAG 312986

Part Submission Warrant

Part Name	Input Shaft Outer	Customer Part Number	250.6.5216.35
Shown on Drawing No.	250.6.5216.35	Organization Part #	
Engineering Change Level	b C009518_MIP_1 (- C004731_MIP_2)	Dated	30-mag-17
Additional Engineering Changes		Dated	

Safety and/or Government Regulation ☐ Yes ☑ No Purchase Order No. Weight (kg) 1.563

Checking Aid No. Checking Aid Engineering Change Level Dated

ORGANIZATION MANUFACTURING INFORMATION

GETRAG MODUGNO

Organization Number, Supplier or Vendor Code

VIA DEI CICLAMINI N°4

Street Address

MODUGNO BARI 70026 ITALY

City Region Postal Code Country

CUSTOMER SUBMITTAL INFORMATION

Customer Name Division

Buyer/Buyer Code

DCT250

Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? ☑ Yes ☐ No ☐ n/a

Submitted by IMDS or other customer format:

Are polymeric parts identified with appropriate ISO marking codes? ☐ Yes ☐ No ☑ n/a

REASON FOR SUBMISSION (check at least one)

- ☑ Initial Submission
- ☐ Engineering Change(s)
- ☐ Tooling: Transfer, Replacement, Refurbishment, or additional
- ☐ Correction of Discrepancy
- ☐ Tooling Inactive > than 1 year
- ☐ Change to Optional Construction or Material
- ☐ Supplier or Material Source Change
- ☐ Change in Part Processing
- ☐ Parts Produced at Additional Location
- ☐ Other - please specify below

REQUESTED SUBMISSION LEVEL (Check one)

- ☐ Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
- ☐ Level 2 - Warrant with product samples and limited supporting data submitted to customer.
- ☑ Level 3 - Warrant with product samples and complete supporting data submitted to customer.
- ☐ Level 4 - Warrant and other requirements as defined by customer.
- ☐ Level 5 - Warrant with product samples and complete supporting data reviewed at organization's manufacturing location.

SUBMISSION RESULTS

The results for ☑ dimensional measurements ☑ material and functional tests ☐ appearance criteria ☐ statistical process package

These results meet all drawing and specification requirements: ☑ Yes ☐ NO (If "NO" - Explanation Required)

Mold / Cavity / Production Process

DECLARATION

I hereby affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of 1860 / 24 hours. I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from this declaration below.

EXPLANATION / COMMENTS: **First submission (only differences from 250.1.5176.36)**

Is each Customer Tool properly tagged and numbered? ☐ Yes ☐ No ☑ n/a

Organization Authorized Signature Date 28-ago-17

Print Name Maselli Vito Carlo Phone No. tel 390805858300 Fax No.

Title GPS 1-2 Leader E-mail carlo.maselli@magna.com

FOR CUSTOMER USE ONLY (IF APPLICABLE)

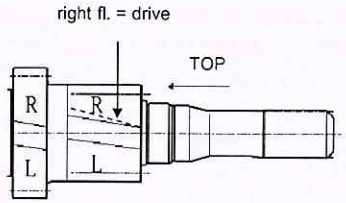
Part Warrant Disposition: ☑ Approved ☐ Rejected ☐ Other

Customer Signature Date 28.08.17

Print Name Customer Tracking Number (optional)

Released by Holger.Paassen on 2017-03-22
Document Status: approved

STIRNRAD / GEAR	außenverzahnt / external	Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) gültig für Werte am Einzelzahn / Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth (8)				
Zähnezahl z / Number of teeth	21		linke Fl. / left flank	rechte Fl. / right flank		
Modul m_n / Normal module	2.000000	Profil-Formabweichung $f_{f\alpha}$ / Profile form error	# 0.004		Eingriffsteilungs-Abweich. f_{pe} / Normal pitch error	0.014
Eingriffswinkel α_n / Normal pressure angle	20° 0' 0"	Profil-Gesamtabweichung F_α / Total profile error			Teilungs-Einzelabweichung f_p / Adjacent pitch error	0.014
Schrägungswinkel β / Helix angle	22° 0' 0"	Profil-Winkelabweichung $f_{H\alpha}$ / Profile angle error	0.000 ± 0.010	0.000 ± 0.010	Teilungssprung f_u / Diff. bet. adjacent pitches	0.018
Steigungsrichtung / Hand of helix	RIGHT	Flankenl.-Winkelabweich. $f_{H\beta}$ / Tooth alignment error	0.000 ± 0.013	0.000 ± 0.013	Teilungs-Summenabweich. F_{pk} / Cumulative circ. pitch error	
Profilverschiebungsfaktor x / Addendum modification coeff.	0.390	Flankenl.-Gesamtabweich. F_β / Total alignment error			Rundlaufabweichung F_r / Radial run-out	0.028
Teilkreisdurchmesser d / Pitch diameter	45.298	Flankenl.-Formabweich. $f_{f\beta}$ / Longitudinal alignment err.	# 0.004		Zahndickenschwankung R_s / Range of tooth thickn. error	
Kopfkreisdurchmesser d_a / Outside diameter	51.60 $_{-0.26}$	Teilungs-Gesamtabweich. F_p / Cumulative pitch error	0.036			
Kopfnutzkreisd. theo. max. d_{Na} / Tip diam. usable theo.	51.20	Einf.-Wälzabweichung $F_{i'}$ / Tangential composite error			Zweifl.-Wälzabweichung $F_{i''}$ / Radial composite error	0.032
Kopfnutzkreisd. theo. min. d_{Na} / Tip diam. usable theo.	50.73	Einflanken-Wälzsprung $f_{i'}$ / Tang. tooth to tooth comp. err.			Zweifl.-Wälzsprung $f_{i''}$ / Radial tooth to tooth comp. err.	0.012
Fußkreisdurchmesser d_f / Root diameter	40.30 $_{-0.45}$	Radbreite im Meßkreis d_M b / Facewidth in meas. diam.	20.50		Meßkreis Krümmungsradius ρ_{dM} / Radius of curvature meas. diam.	10.22
Fußnutzkreisdurchmesser d_{Nf} / Root diameter usable	43.20					
Grundkreisradius r_b / Base circle radius	21.083					
Grundkreisdurchmesser d_b / Base diameter	42.166					
Normalzahndicke max. s_n / Normal tooth thickness	3.709					
Normalzahndicke min. s_n / Normal tooth thickness	3.679					
Meßzähnezahl k / Number of teeth spanned	4					
Zahnweite max. W_k / Base tangent length	21.928					
Zahnweite min. W_k / Base tangent length	21.900					
Meßkugeldurchmesser D_M / Ball diameter	3.0000					
Diam. Zweikugelmaß max. M_{dK} / Measurement o. balls	49.712					
Diam. Zweikugelmaß min. M_{dK} / Measurement o. balls	49.643					
Verdrehflankenspiel theo. / Circumferential backlash	0.063 / 0.177					



Hondurchmesser = 42.67 $_{-0.30}$ ≡ 3.27
honing diameter

Der Verlauf der Profil- und Flankenlinie muss über den Messbereich stetig sein (ein- oder mehrfache Richtungsänderungen sind nicht zulässig)
The form of the profile and helix has to be continuous (one or more changes of directions are not allowed)
Für fp max. zwei Wellen zulässig
For fp max. two waves allowed

Vorbearbeitungsdaten siehe Verzahnungsblatt Vorbearbeitung gleicher Nr.
For pre-machining dimensions, see gear data sheet same number

Wkz-Profil siehe Werkzeugdatenblatt Nr.
For Tooth profile, see tool data sheet number 250.6.5216.35

+ linke Flanke / left flank	- Profil / Profile -	rechte Flanke / right flank +
Kopf / Tip: 14.52 / 14.10	C_α = 0.000 $^{+0.004}$	14.52 / 14.10
Fuß / Root: 4.70		4.70
$f_{H\alpha}$ = 0.000 ± 0.006	Average values	$f_{H\alpha}$ = 0.000 ± 0.006

* Schreibbeginn
* Start of checking ∅ = 42.67 $_{-0.30}$ ≡ 3.27

- linke Flanke / left flank	+ Flankenlinie / Tooth trace -	rechte Flanke / right flank +
unten / down	crowning: 0.001 $^{+0.004}$ (0.8*b)	
	Lead Twist +0.010 ± 0.008	
	(Lead Twist = fHß_Root on pdNf = 4.70 minus fHß_Tip on pdNa = 13.80)	
oben / up: $f_{H\beta}$ = 0.000 ± 0.006	Average values	$f_{H\beta}$ = 0.000 ± 0.006

* ffαf (zwischen dNf und dem Schreibbeginn ds) max ffα/2, jedoch 0.003 zulässig
* ffαf (between dNf and start of checking ds) max ffα/2, 0.003 allowable.

Profil- und Flankenlinienprüfung nach VDI/VDE 2612
Tabellenwerte für F_β und $f_{H\beta}$ sind auf die gesamte Radbreite im Meßkreis d_M bezogen
Flankenlinienprüfbereich Lβ = 0.8*b hochgerechnet auf 1.0*b
Begriffe für Stirnräder nach DIN 868, 3960, 3998

Profile and helix checking according to VDI/VDE 2612
Listed tolerance data for F_β and $f_{H\beta}$ refers to the total face width in the meas. dia. d_M
Tooth trace testing area Lβ = 0.8*b calculated to 1.0*b
Terms of the tooth system according to DIN (German Industrial Standards) No. 868, 3960, 3998

Buch.	Anz.	Änd.Nr.		Datum	Name

Abbildungen sind unmaßstäblich.
Diagrams not to scale.

Ersatz für
Erstverwendung bei Getriebetype:

	Datum	Name
gez.	2016-07-08	Cricenti, Fabrizio
gepr.		

Verzahnungsblatt Endkontrolle
Final Check Gear Data
Benennung:
Naming:
Input Shaft Outer 2nd

Verteiler:

Schutzvermerk nach ISO 16016 beachten
Protection per ISO 16016

GETRAG
GETRAG Getriebe- und Zahnradfabrik Hermann Hagenmeyer GmbH & Cie KG

Remark:

Zeichnungsnummer:
Drawing number:
250.6.5216.35

GETRAG Production Part Approval

DIMENSIONAL TEST RESULTS

Organization:	GETRAG	Part Number:	250.6.5216.35
Supplier/Vendor Code:	GETRAG Modugno	Part Name:	Input Shaft Outer
INSPECTION FACILITY:		Design Record Change Level:	30/05/2017
NA		Engineering Change Documents:	b C009518_MIP_1 (- C004731_MIP_

Item	Dimension/Specification	Specification / Limits		Test Date	Qty. Tested	Organization Measurement Results (Data) 1	2	3	4	5	test distruttivo	Ok	Not Ok
1a	Ampiezza gola identificativa	1.200	0.800		5	0.894	0.928	0.912	0.979	0.888		ok	
1b	Diametro gola identificativa	73.000	72.000		5	72.183	72.117	72.198	72.163	72.240		ok	
1c	Raggio gola idetificativa (solo rif.)	--	--		5	0.813	0.813	0.843	0.814	0.910		ok	
1d	Profondità gola identificativa	0.300	0.100		5	0.133	0.131	0.128	0.127	0.132		ok	
2	Profile Teeth Z21	--	--		5	OK	OK	OK	OK	OK		ok	
3	Root diameter Z21	40.300	39.850		5	40.024	40.019	40.017	40.020	40.019		ok	
4	Outside diameter Z21	51.600	51.340		5	51.393	51.390	51.390	51.390	51.390		ok	
5	MDK Z21	49.712	49.643		5	49.679	49.680	49.673	49.681	49.681		ok	

SIGNATURE	TITLE	DATE
D. Vicenti	ME	28/08/2017

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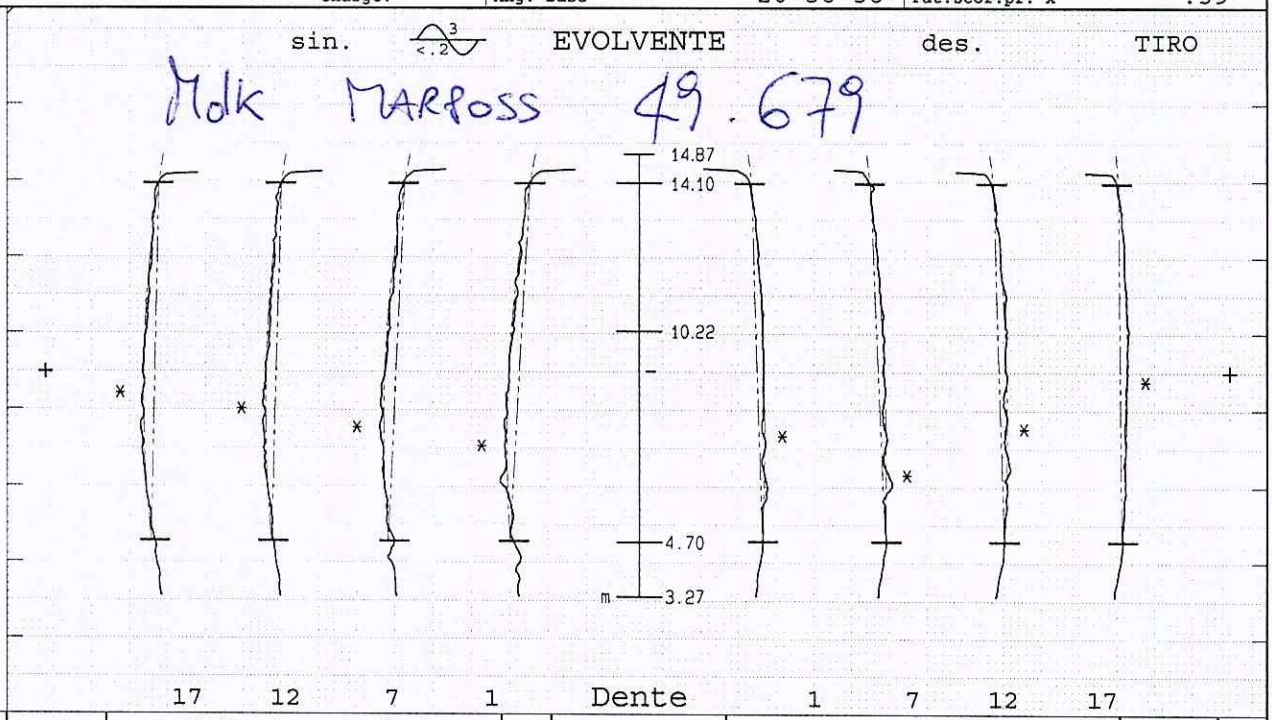
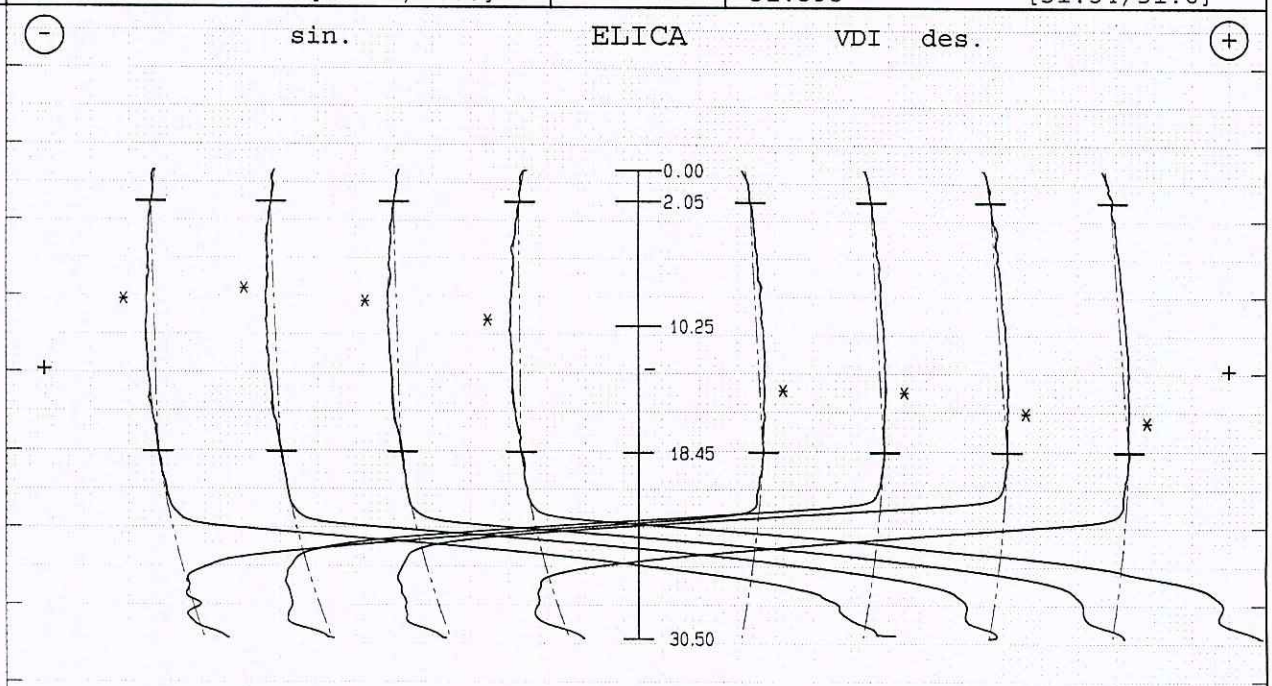
Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	P26 B7681	Controllore:	turno A	Data:	26.08.2017 08:06
Denominazione:	Input Outer Z21	Numero denti z	21	Largh.fasc.dent. b	30.5mm
Numero disegno.:	250.6.5216.35-IIF	Modulo m	2mm	Tratto evolv. La	9.4mm
Commessa/serie nr.:	1	Angolo pressione	20°00'00"	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formnext 1	Angolo elica	22°00'00"	Inizio elab. M1	4.7mm
Untersuchungszweck:	Laufende Messung	Ø Base db	42.1659mm	Palpatore Ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	20°36'38"	Fat.scor.pr. x	.39



Tolerance	Medio	Val.misur [µm]				Qual	Tolerance	Val.misur [µm]				Medio	Qual
fHαm ±6	-4	Var a 3					±6	Var a 3				-3	
fHα ±10	-4	-2	-3	-4	-5		±10	-3	-4	-3	-1	-3	
Fα	6	5	5	6	8			5	6	5	3	5	
ffα 4	3	2	2	3	3		4	2	2	2	1	2	
Cα 0/4	3	3	3	3	3		0/4	2	2	2	2	2	
P/T-ø [mm]	40.024	[39.85/40.3]						51.393				[51.34/51.6]	



fHßm ±6	-2	Var ß 2					±6	Var ß 2				-5
fHß ±13	-2	-2	-3	-2	-1		±13	-4	-4	-5	-6	-5
Fß	3	3	4	3	2			3	3	5	5	4
ffß 4	1	1	1	1	1		4	1	1	1	1	1

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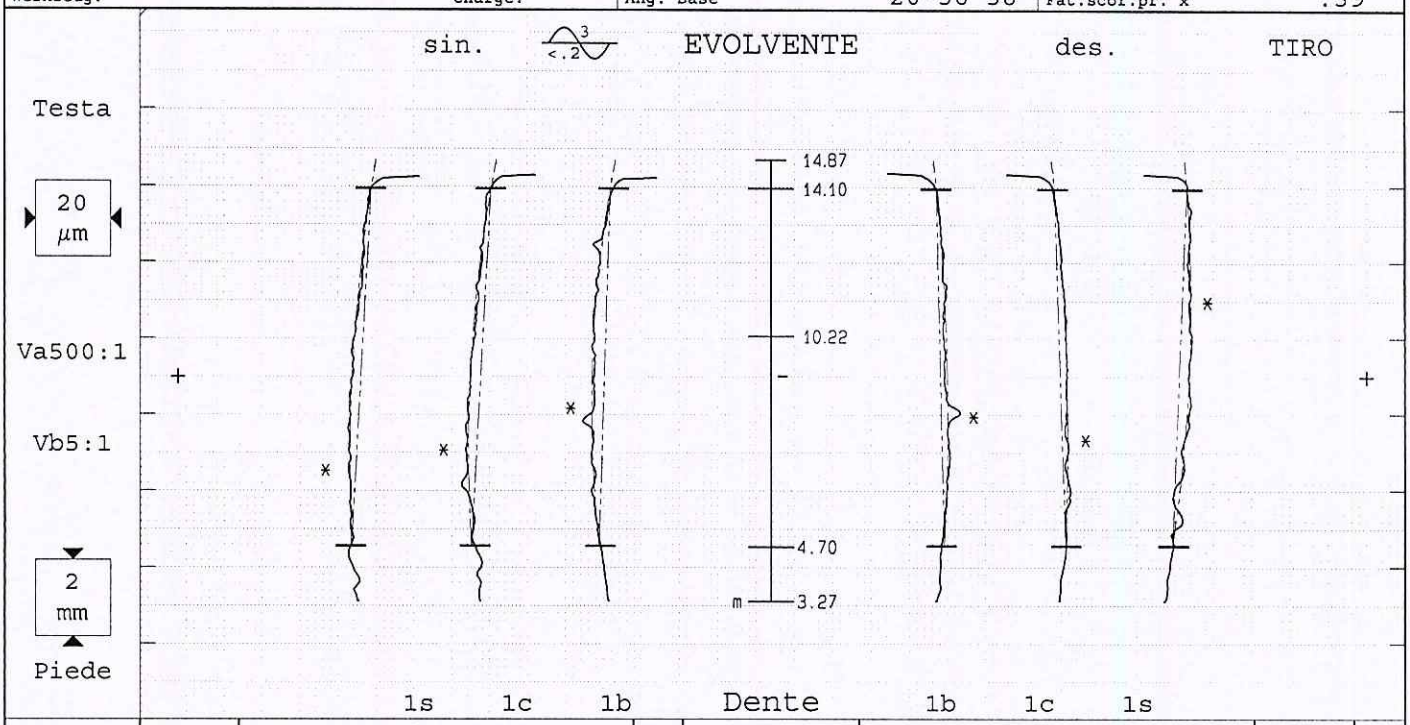
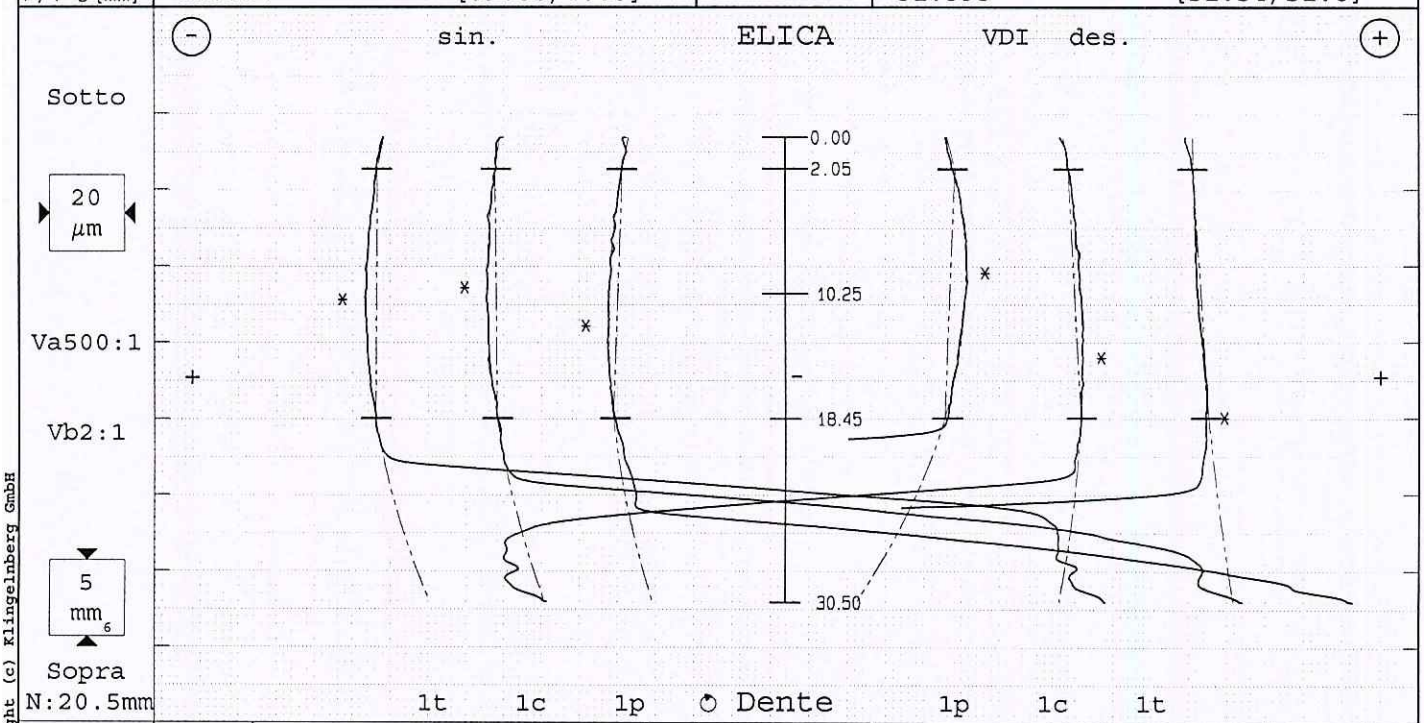
Ruota cilindrica Svergolamento

Nr. prog.: STI0412_06 0	P26 B7681	Controllore:	turno A	Data:	26.08.2017 08:06
Denominazione:	Input Outer Z21	Numero denti z	21	Largh.fasc.dent. b	30.5mm
Numero disegno.:	250.6.5216.35-IIF	Modulo m	2mm	Tratto evolv. La	9.4mm
Commessa/serie nr.:	1	Angolo pressione	20°00'00"	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formnost 1	Angolo elica	22°00'00"	Inizio elab. M1	4.7mm
Untersuchungszweck:	Laufende Messung	ø Base db	42.1659mm	Palpatore ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	20°36'38"	Fat.scor.pr. x	.39



Tolerance	Medio	Val.misur[µm]				Qual	Tolerance	Val.misur[µm]				Medio	Qual
fHαm ±6	-4	Var a 2					±6	Var a 7				0	
fHα ±10	-4		-5	-5	-3		±10	-2	-3	4		0	
Fα	7		6	8	8			6	5	6		6	
ffα 4	2		1	3	3		4	4	2	3		3	
Cα 0/4	3		2	3	3		0/4	2	2	3		2	
P/T-ø [mm]	40.024	[39.85/40.3]						51.393			[51.34/51.6]		



fHßm ±6	1	Var ß -2					±6	Var ß -8				-2	
fHß ±13	1		1	-1	3		±13	3	-4	-5		-2	
Fß	2		2	2	3			4	3	4		4	
ffß 4	1		1	1	1		4	1	1	1		1	
Cß 1/5	2		3	2	2		1/5	4	2	-1		2	
Bd 10±8	2						10±8					8	

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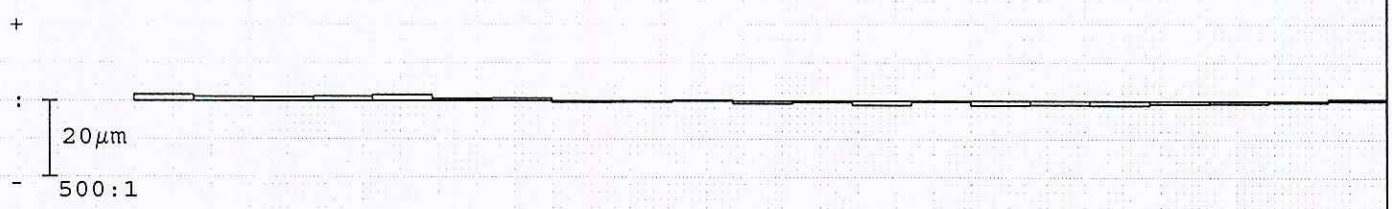
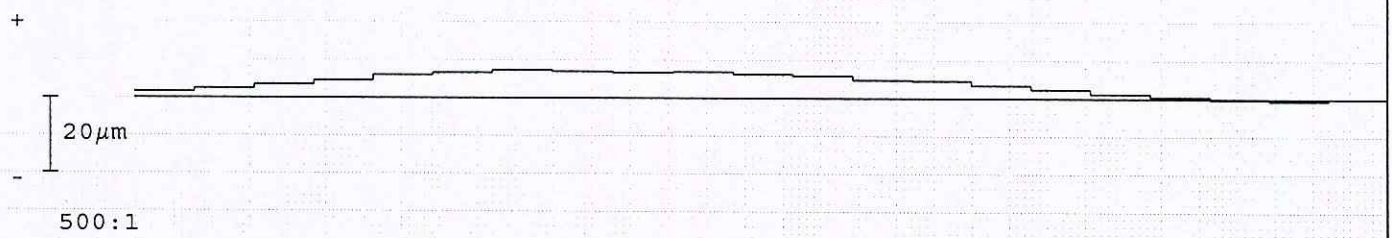
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0 P26 B7681	Controllore: turno A	Data:	26.08.2017 08:06
Denominazione: Input Outer Z21	Numero denti z 21	Angolo pressione	20°00'00"
Numero disegno.: 250.6.5216.35-IIF	Modulo m 2mm	Angolo elica	22°00'00"
Commessa/serie nr.: 1	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001 Spindel: Formnestl	Werkzeug:	Charge:	

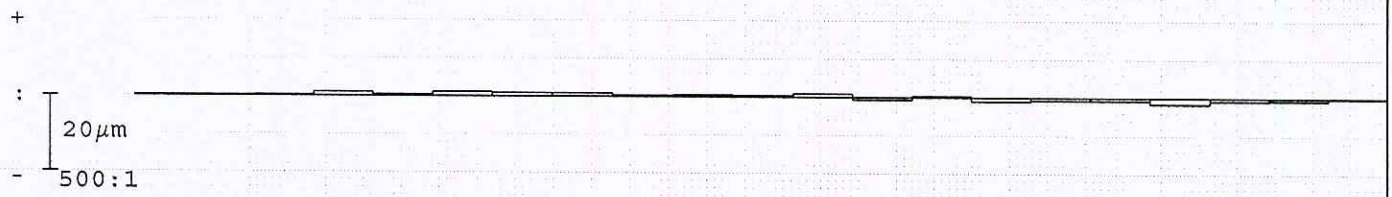
Errori singoli di divisione fp fianco sinistro



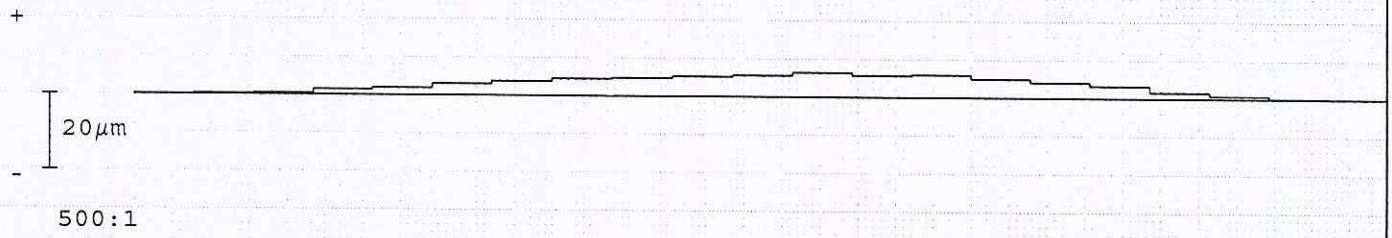
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



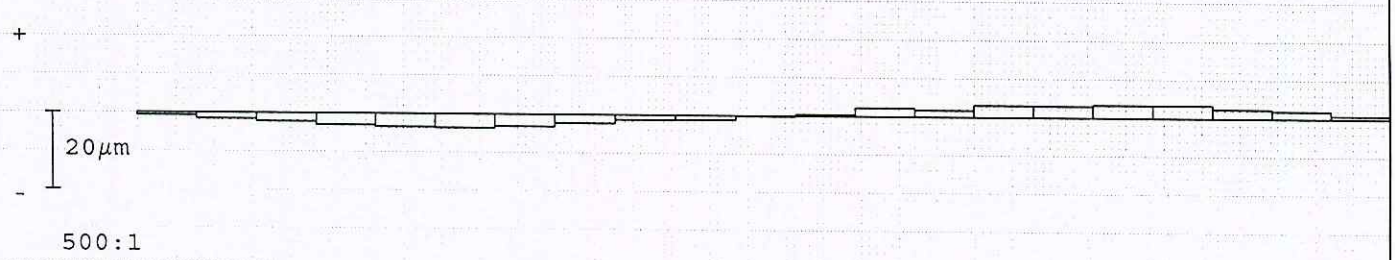
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:46.859 z=10.3mm

		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2		14		2		14	
Gr. salto di passo	fu max	1		18		2		18	
Scarto di divisione	Rp	3				3			
Err. globale di divisione	Fp	8		36		6		36	
Err. cordale di divisione	Fpz/8	4				3			

Centricità Fr (Ø-sfera =3.75mm) ◎ : 7µm



Err. di concentricitá	Fr	7	28	

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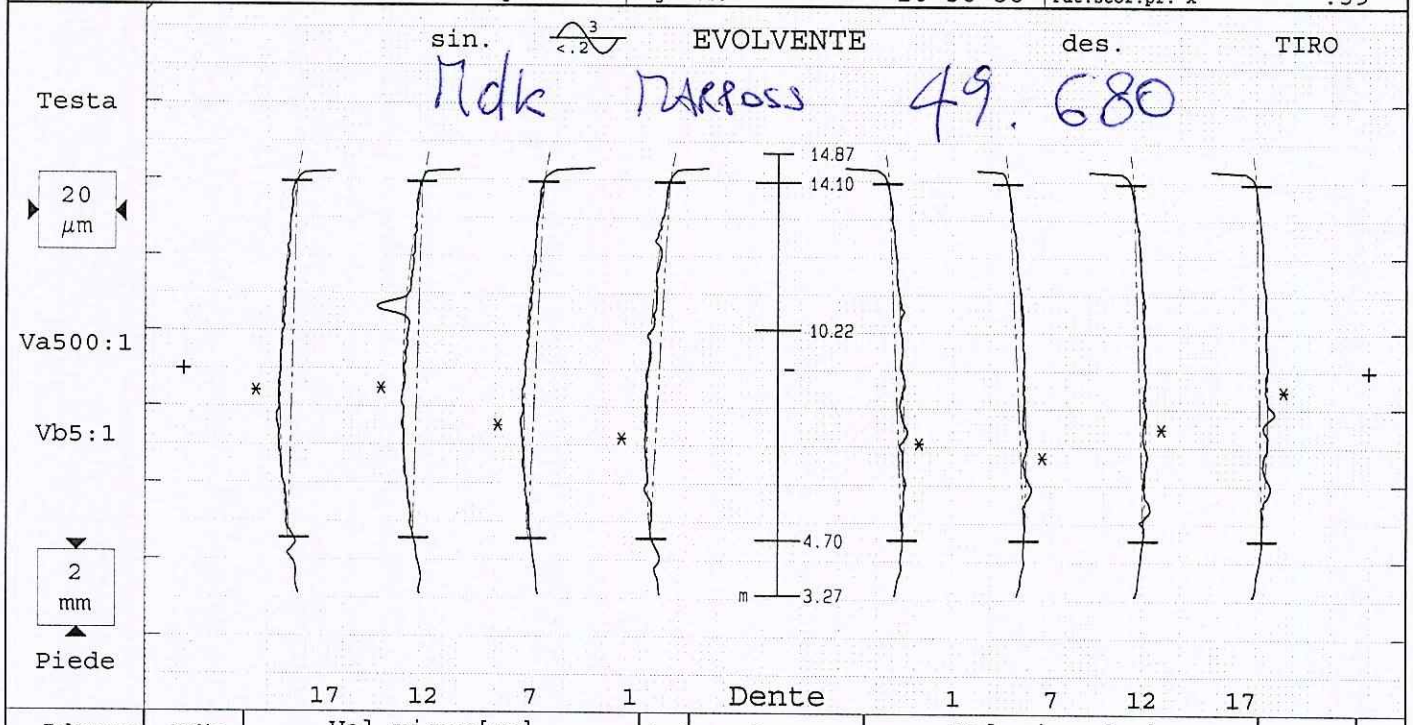
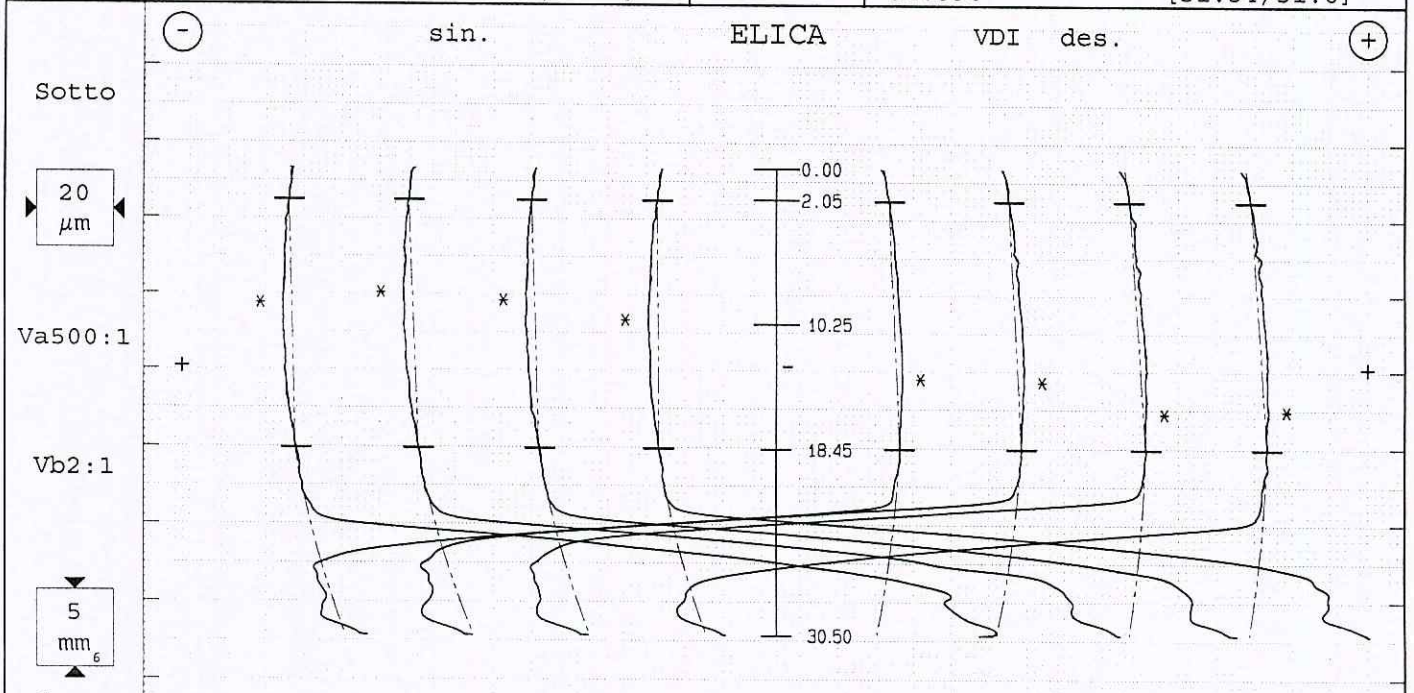
Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	P26 B7681	Controllore:	turno A	Data:	26.08.2017 08:10
Denominazione:	Input Outer Z21	Numero denti z	21	Largh.fasc.dent. b	30.5mm
Numero disegno.:	250.6.5216.35-IIF	Modulo m	2mm	Tratto evolv. La	9.4mm
Commessa/serie nr.:	2	Angolo pressione	20°00'00"	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formnestl	Angolo elica	22°00'00"	Inizio elab. M1	4.7mm
Untersuchungszweck:	Laufende Messung	Ø Base db	42.1659mm	Palpatore Ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	20°36'38"	Fat.scor.pr. x	.39



Tolerance	Medio	Val.misur[µm]				Qual	Tolerance	Val.misur[µm]				Medio	Qual
fHαm ±6	-4	Var a 3					±6	Var a 3				-3	
fHα ±10	-4	-2	-3	-4	-5		±10	-3	-4	-3	-1	-3	
Fα	7	5	12	6	6			5	6	5	5	5	
ffα 4	4	3	9	2	2		4	2	2	3	3	3	
Cα 0/4	3	3	4	3	3		0/4	2	2	2	2	2	
P/T-ø [mm]	40.019	[39.85/40.3]						51.390				[51.34/51.6]	



fHßm ±6	-2	Var ß 3					±6	Var ß 1				-5
fHß ±13	-2	-2	-3	-2	0		±13	-4	-4	-5	-5	-5
Fß	3	3	3	3	2			3	3	5	5	4
ffß 4	1	1	1	1	1		4	0	1	1	1	1

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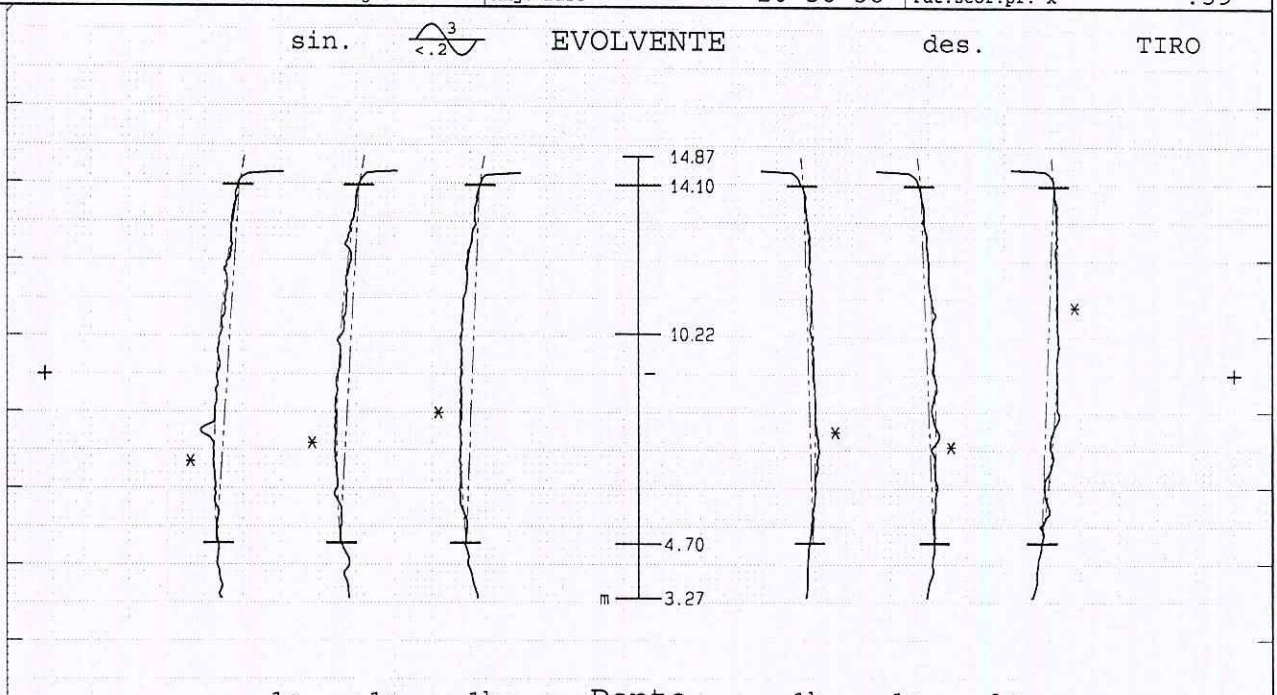
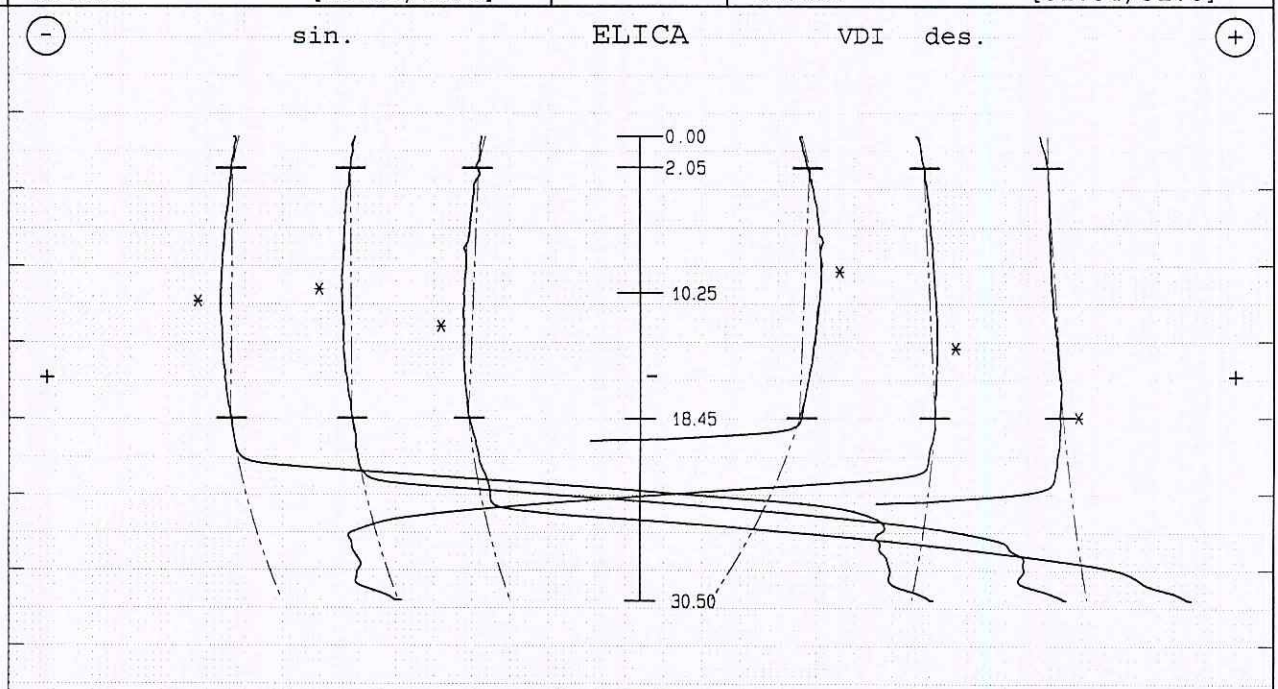
Ruota cilindrica Svergolamento

Nr. prog.: STI0412_06 0	P26 B7681	Controllore:	turno A	Data:	26.08.2017 08:10
Denominazione:	Input Outer Z21	Numero denti z	21	Largh.fasc.dent. b	30.5mm
Numero disegno.:	250.6.5216.35-IIF	Modulo m	2mm	Tratto evolv. La	9.4mm
Commessa/serie nr.:	2	Angolo pressione	20°00'00"	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formnext	Angolo elica	22°00'00"	Inizio elab. M1	4.7mm
Untersuchungszweck:	Laufende Messung	ø Base db	42.1659mm	Palpatore ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	20°36'38"	Fat.scor.pr. x	.39



Tolerance	Medio	Val.misur [µm] 1s	1c	1b	Qual	Tolerance	Val.misur [µm] 1b	1c	1s	Medio	Qual
fHαm ±6	-5	Var a 3				±6	Var a 6			-1	
fHα ±10	-5		-6	-5	-3	±10	-2	-3	3	-1	
Fα	7		10	6	5		4	5	5	5	
ffα 4	3		5	2	1	4	2	2	2	2	
Cα 0/4	3		3	3	3	0/4	2	2	2	2	
P/T-ø [mm]	40.019	[39.85/40.3]					51.390			[51.34/51.6]	



Tolerance	Medio	Val.misur [µm] 1t	1c	1p	Qual	Tolerance	Val.misur [µm] 1p	1c	1t	Medio	Qual
fHßm ±6	1	Var ß -2				±6	Var ß -9			-2	
fHß ±13	1		1	0	3	±13	4	-4	-5	-2	
Fß	3		2	2	4		5	3	4	4	
ffß 4	1		1	1	2	4	1	0	1	1	
Cß 1/5	3		3	2	3	1/5	4	2	-1	2	
Bd 10±8	2					10±8				9	

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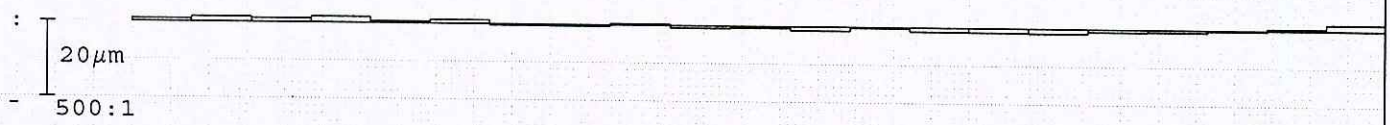
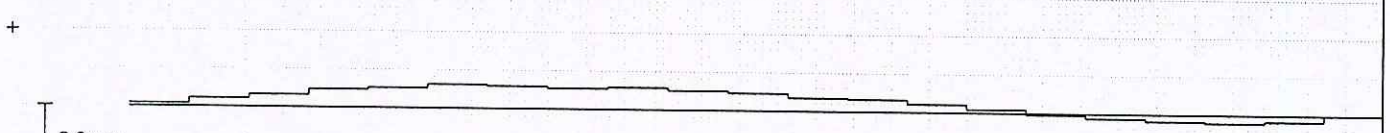
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0 P26 B7681	Controllore: turno A	Data:	26.08.2017 08:10
Denominazione: Input Outer Z21	Numero denti z 21	Angolo pressione	20°00'00"
Numero disegno.: 250.6.5216.35-IIF	Modulo m 2mm	Angolo elica	22°00'00"
Commessa/serie nr.: 2	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001 Spindel: Formnestz	Werkzeug:	Charge:	

Errori singoli di divisione fp fianco sinistro

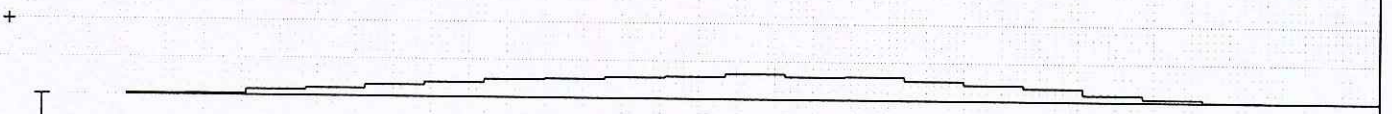


Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

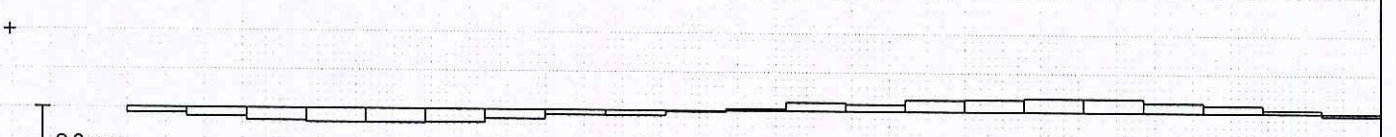
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:46.859 z=10.3mm

		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2		14		2		14	
Gr. salto di passo	fu max	1		18		2		18	
Scarto di divisione	Rp	3				3			
Err. globale di divisione	Fp	8		36		7		36	
Err. cordale di divisione	Fpz/8	4				3			

Centricità Fr (Ø-sfera =3.75mm) ◎ : 7µm



Err. di concentricitá	Fr	7	28	

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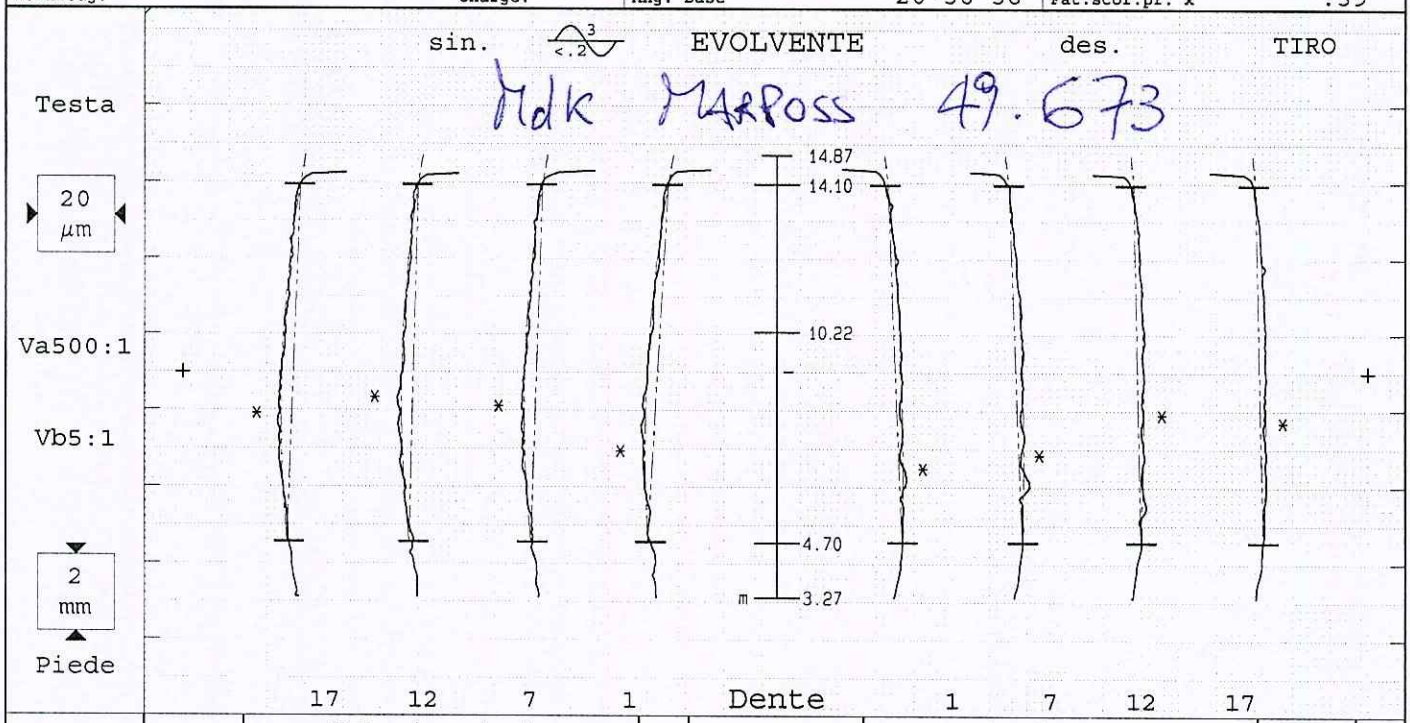
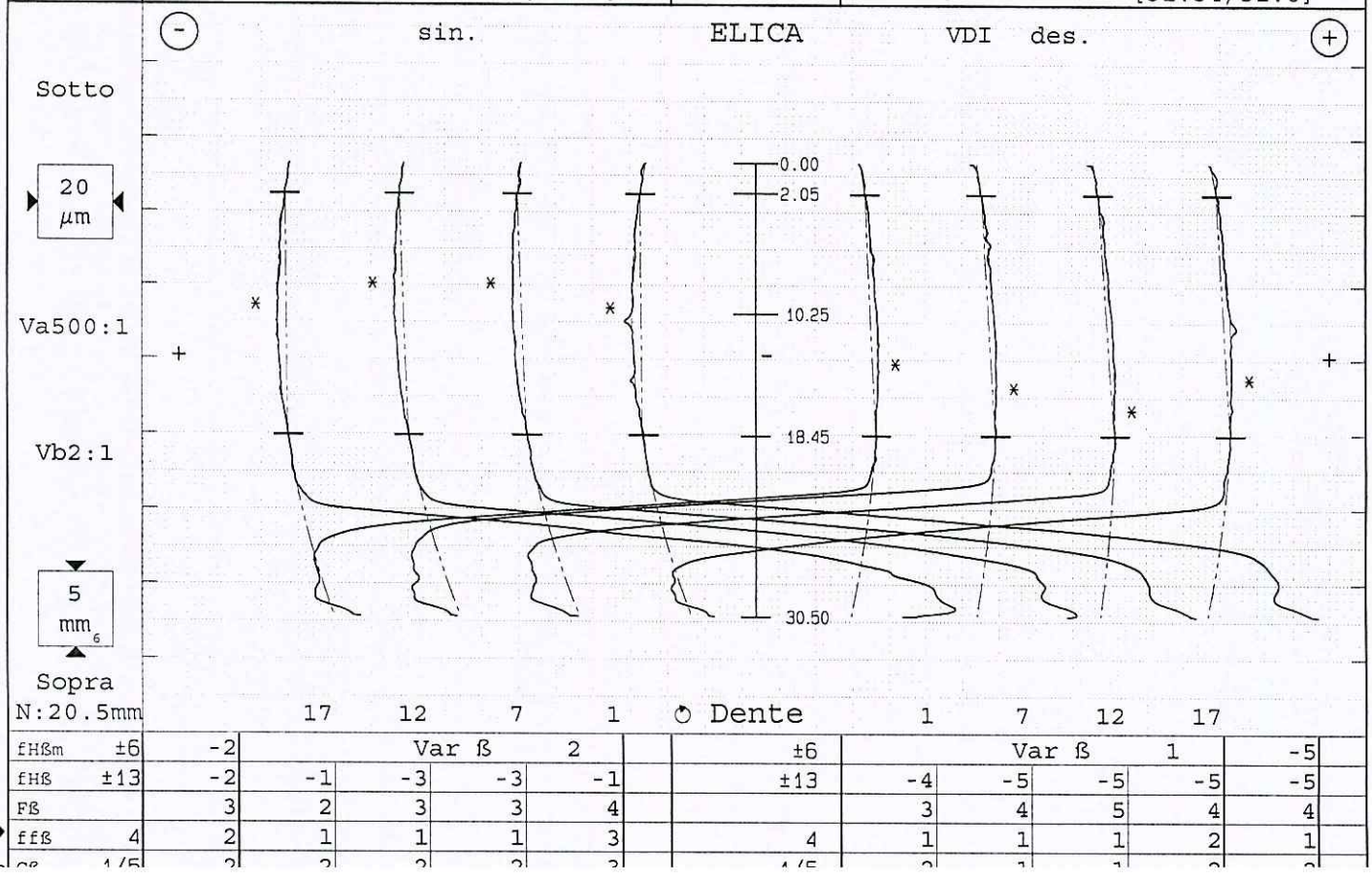
Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	P26 B7681	Controllore:	turno A	Data:	26.08.2017 08:15
Denominazione:	Input Outer Z21	Numero denti z	21	Largh.fasc.dent. b	30.5mm
Numero disegno.:	250.6.5216.35-IIF	Modulo m	2mm	Tratto evolv. La	9.4mm
Commessa/serie nr.:	3	Angolo pressione	20°00'00"	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formnext	Angolo elica	22°00'00"	Inizio elab. M1	4.7mm
Untersuchungszweck:	Laufende Messung	Ø Base db	42.1659mm	Palpatore Ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	20°36'38"	Fat.scor.pr. x	.39



Mdk MARPOSS 49.673

Tolerance	Medio	Val.misur [µm]				Qual	Tolerance	Val.misur [µm]				Medio	Qual
fHαm ±6	-4	Var a 3					±6	Var a 2				-3	
fHα ±10	-4	-4	-2	-3	-5		±10	-4	-4	-2	-2	-3	
Fα	6	6	5	5	7			6	6	4	4	5	
ffα 4	2	2	2	2	2		4	2	3	2	2	2	
Cα 0/4	3	3	3	3	3		0/4	2	2	2	2	2	
P/T-ø [mm]	40.017	[39.85/40.3]						51.390				[51.34/51.6]	



fHßm ±6	-2	Var ß 2					±6	Var ß 1				-5
fHß ±13	-2	-1	-3	-3	-1		±13	-4	-5	-5	-5	-5
Fß	3	2	3	3	4			3	4	5	4	4
ffß 4	2	1	1	1	3		4	1	1	1	2	1
Cß 1/5	2	2	2	2	3		1/5	2	1	1	2	2

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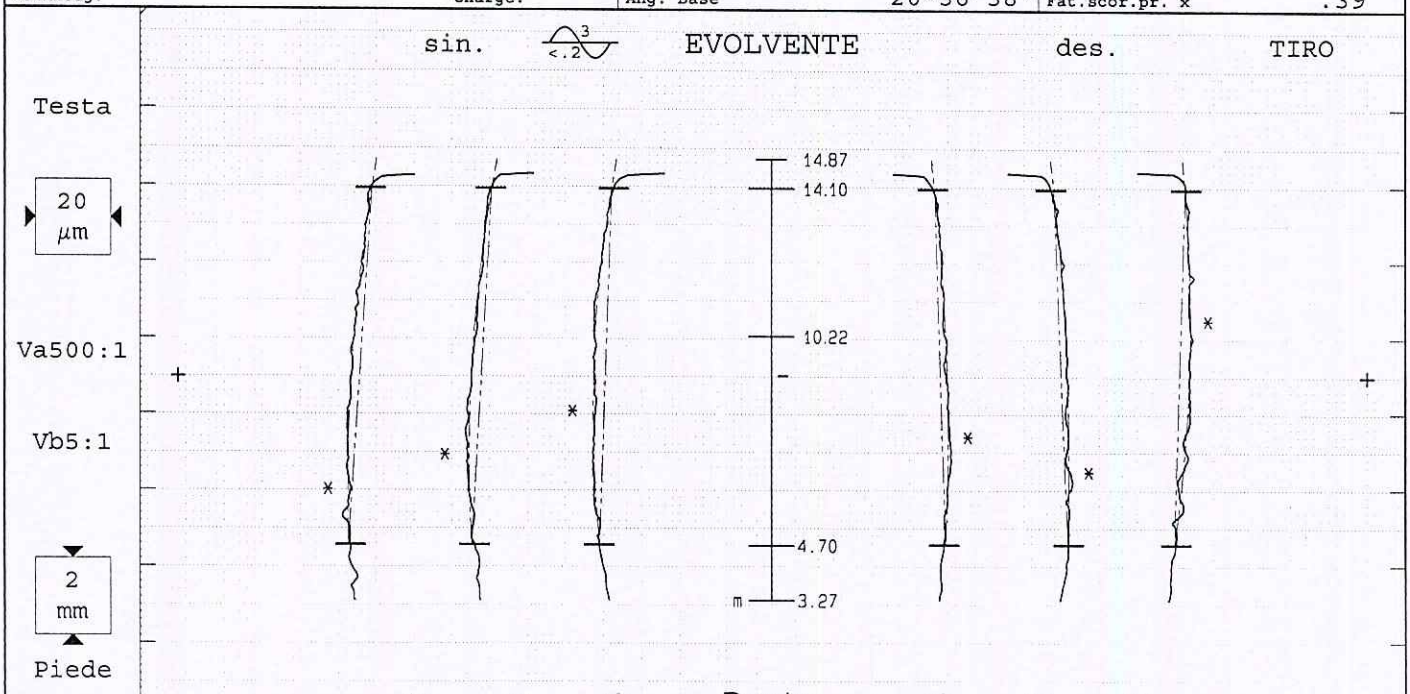
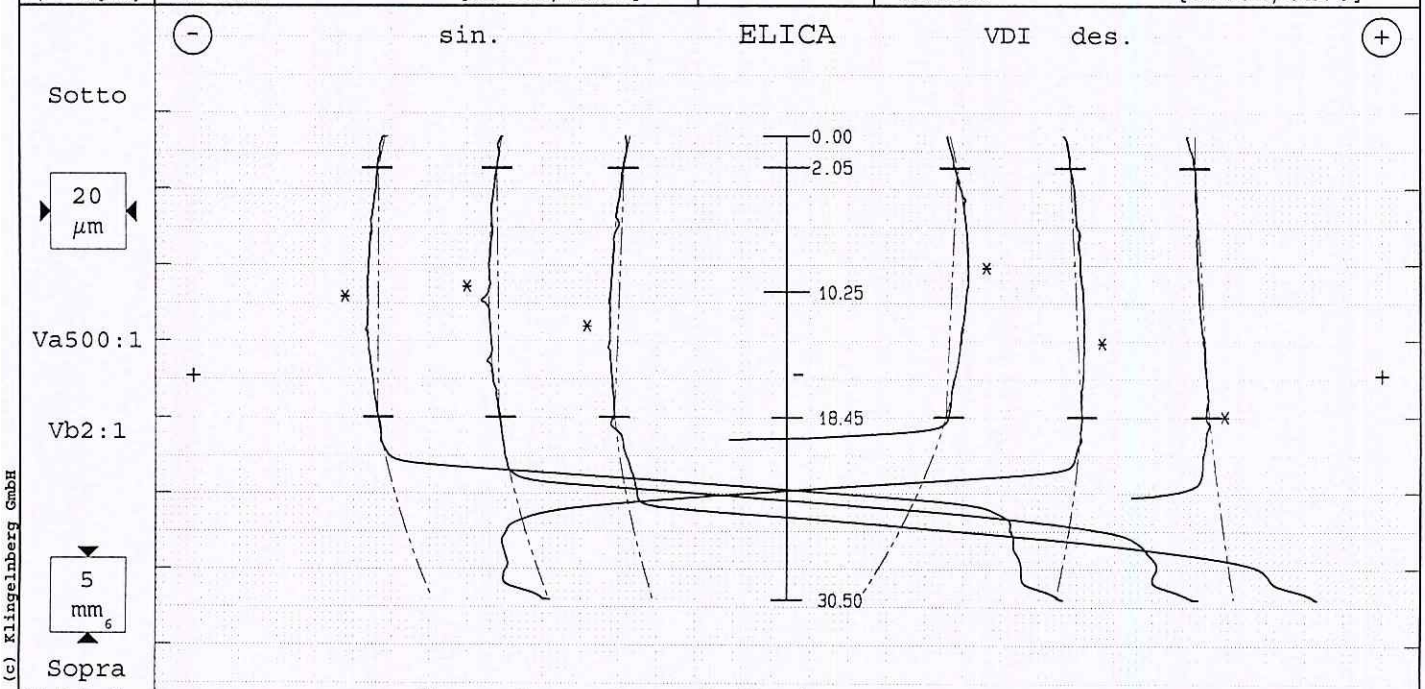
Ruota cilindrica Svergolamento

Nr. prog.: STI0412_06 0	P26 B7681	Controllore:	turno A	Data:	26.08.2017 08:15
Denominazione:	Input Outer Z21	Numero denti z	21	Largh.fasc.dent. b	30.5mm
Numero disegno.:	250.6.5216.35-IIF	Modulo m	2mm	Tratto evolv. La	9.4mm
Commessa/serie nr.:	3	Angolo pressione	20°00'00"	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formnext	Angolo elica	22°00'00"	Inizio elab. M1	4.7mm
Untersuchungszweck:	Laufende Messung	ø Base db	42.1659mm	Palpatore ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	20°36'38"	Fat.scor.pr. x	.39



Tolerance	Medio	Val.misur [µm] 1s	1c	1b	Qual	Tolerance	Val.misur [µm] 1b	1c	1s	Medio	Qual
fHαm ±6	-5	Var a 3				±6	Var a 7			-1	
fHα ±10	-5		-6	-5	-3	±10	-3	-4	3	-1	
Fα	7		7	7	6		5	6	6	6	
ffα 4	2		2	2	2	4	2	2	3	2	
Cα 0/4	3		2	3	3	0/4	2	2	3	2	
P/T-ø [mm]	40.017	[39.85/40.3]					51.390	[51.34/51.6]			



Tolerance	Medio	Val.misur [µm] 1t	1c	1p	Qual	Tolerance	Val.misur [µm] 1p	1c	1t	Medio	Qual
fHßm ±6	1	Var ß -3				±6	Var ß -9			-2	
fHß ±13	1		0	-1	3	±13	4	-4	-5	-2	
Fß	3		2	4	4		4	3	5	4	
ffß 4	2		1	3	1	4	1	1	1	1	
Cß 1/5	3		3	3	2	1/5	4	2	-1	2	
Bd 10±8	3					10±8				9	

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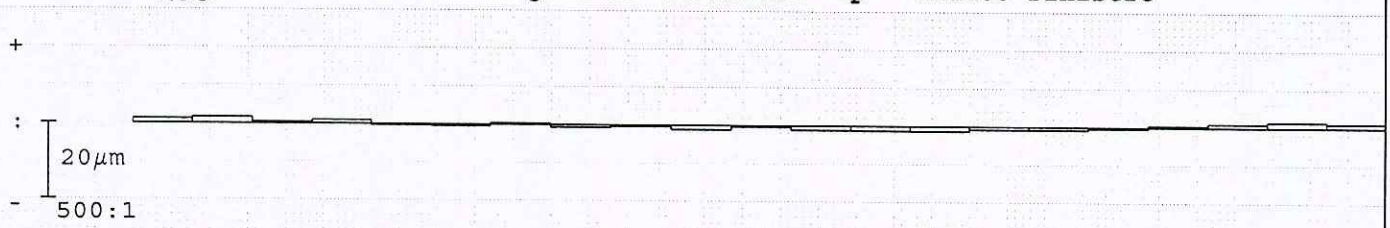
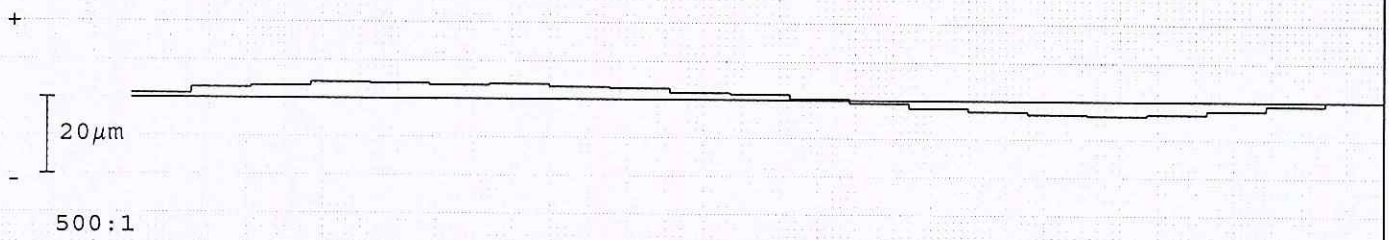
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0 P26 B7681	Controllore: turno A	Data: 26.08.2017 08:15
Denominazione: Input Outer Z21	Numero denti z 21	Angolo pressione 20°00'00"
Numero disegno.: 250.6.5216.35-IIF	Modulo m 2mm	Angolo elica 22°00'00"
Commessa/serie nr.: 3	Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001 Spindel: Formneat 1	Werkzeug:	Charge:

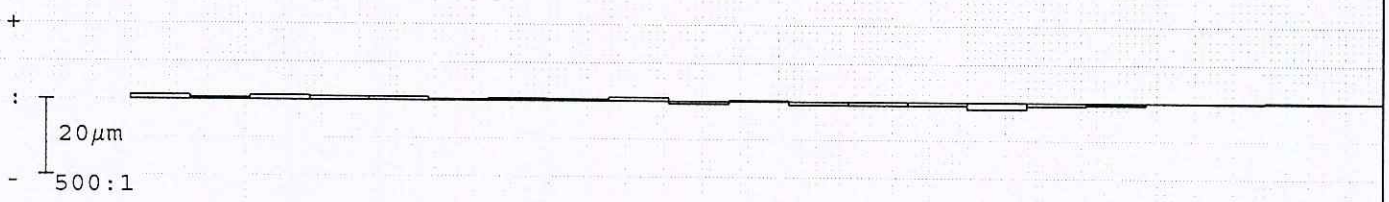
Errori singoli di divisione fp fianco sinistro



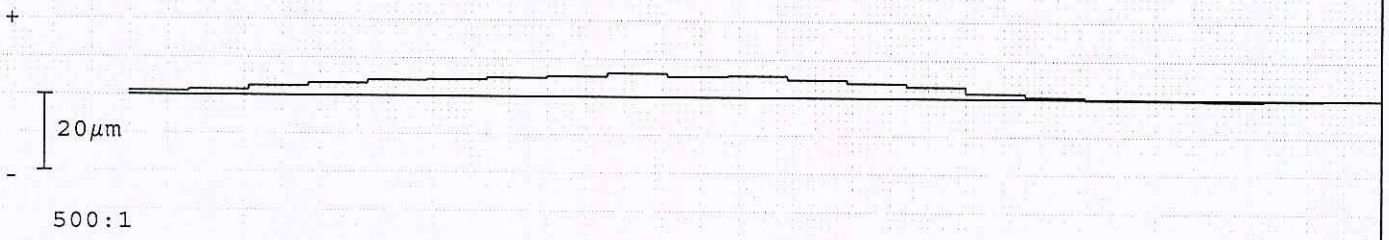
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



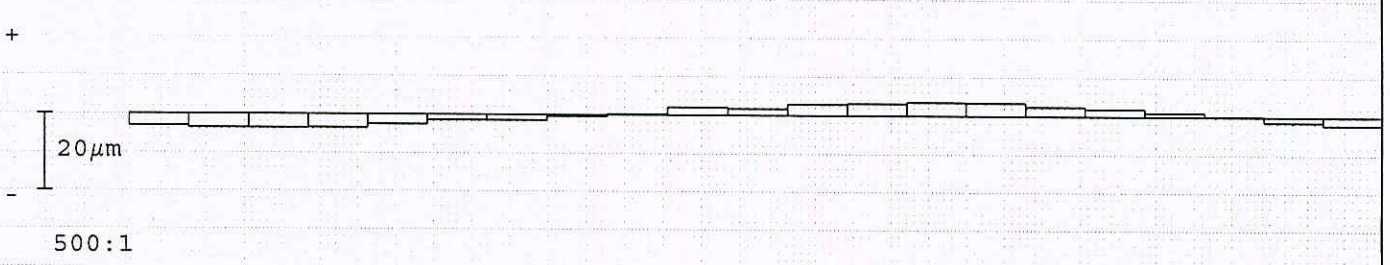
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:46.859 z=10.3mm

		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2		14		2		14	
Gr. salto di passo	fu max	1		18		2		18	
Scarto di divisione	Rp	3				3			
Err. globale di divisione	Fp	8		36		7		36	
Err. cordale di divisione	Fpz/8	4				3			

Centricità Fr (Ø-sfera =3.75mm) ◎ : 7µm



Err. di concentricitá	Fr	7	28	

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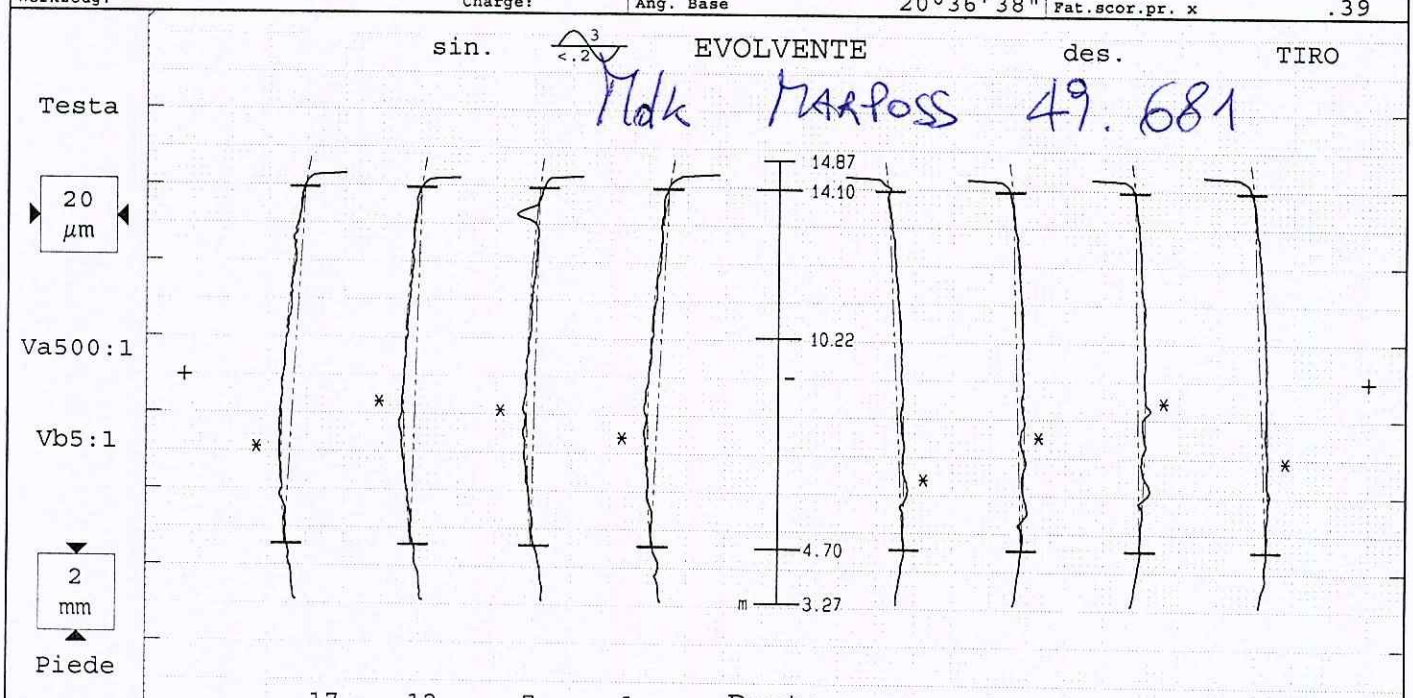
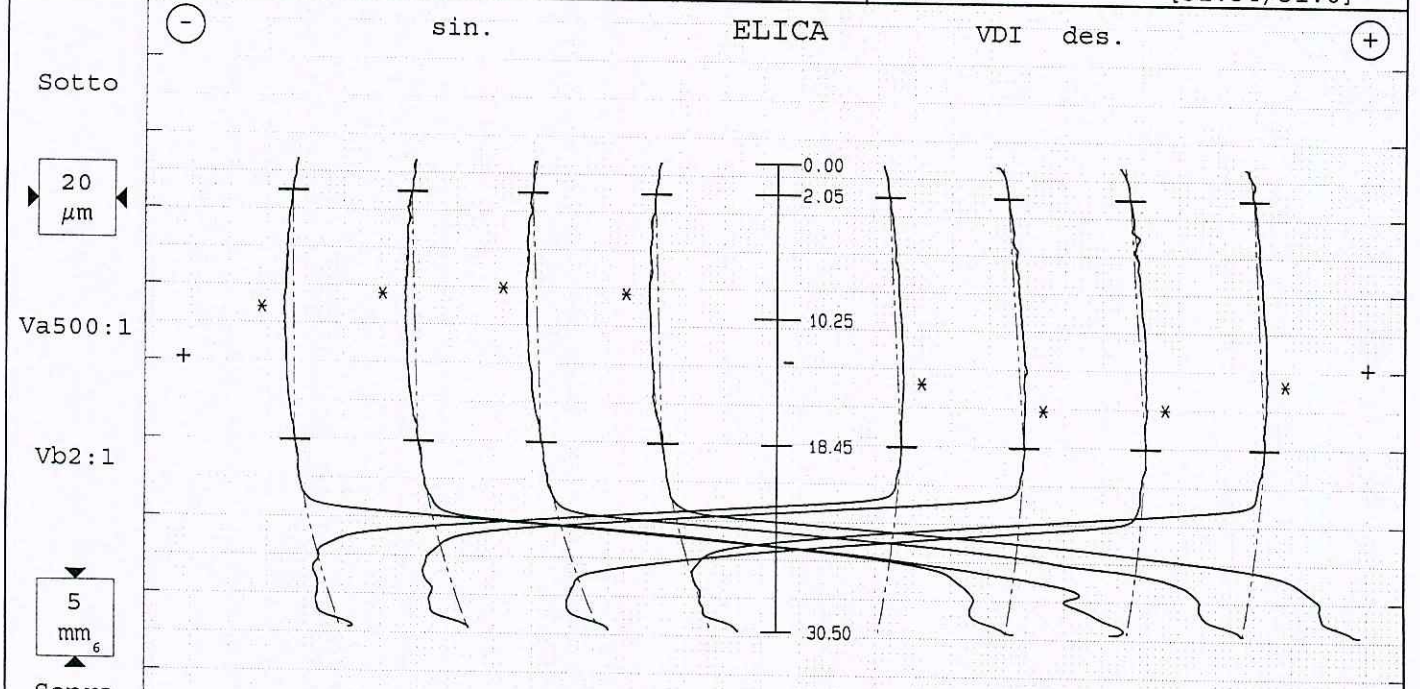
Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	P26 B7681	Controllore:	turno A	Data:	26.08.2017 08:20
Denominazione:	Input Outer Z21	Numero denti z	21	Largh.fasc.dent. b	30.5mm
Numero disegno.:	250.6.5216.35-IIF	Modulo m	2mm	Tratto evolv. La	9.4mm
Commessa/serie nr.:	4	Angolo pressione	20°00'00"	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formnext	Angolo elica	22°00'00"	Inizio elab. M1	4.7mm
Untersuchungszweck:	Laufende Messung	Ø Base db	42.1659mm	Palpatore Ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	20°36'38"	Fat.scor.pr. x	.39



Tolerance	Medio	Val.misur [µm]				Qual	Tolerance	Val.misur [µm]				Medio	Qual
		17	12	7	1			Dente					
								1	7	12	17		
fHαm ±6	-4	Var a			3		±6	Var a			3	-3	
fHα ±10	-4	-5	-3	-2	-4		±10	-4	-3	-1	-3	-3	
Fα	7	7	6	7	6			6	5	4	5	5	
ffα 4	3	2	2	6	2		4	2	2	3	1	2	
Cα 0/4	3	3	3	2	3		0/4	2	2	2	2	2	
P/T-Ø [mm]	40.020			[39.85/40.3]				51.390			[51.34/51.6]		



		17	12	7	1			Dente				
								1	7	12	17	
fHßm ±6	-2	Var ß			2		±6	Var ß			1	-5
fHß ±13	-2	-1	-2	-3	-2		±13	-4	-5	-5	-4	-5
Fß	3	2	3	3	3			3	5	5	3	4
ffß 4	1	1	1	1	1		4	1	1	2	1	1
Cß 1/5	2	2	2	3	2							

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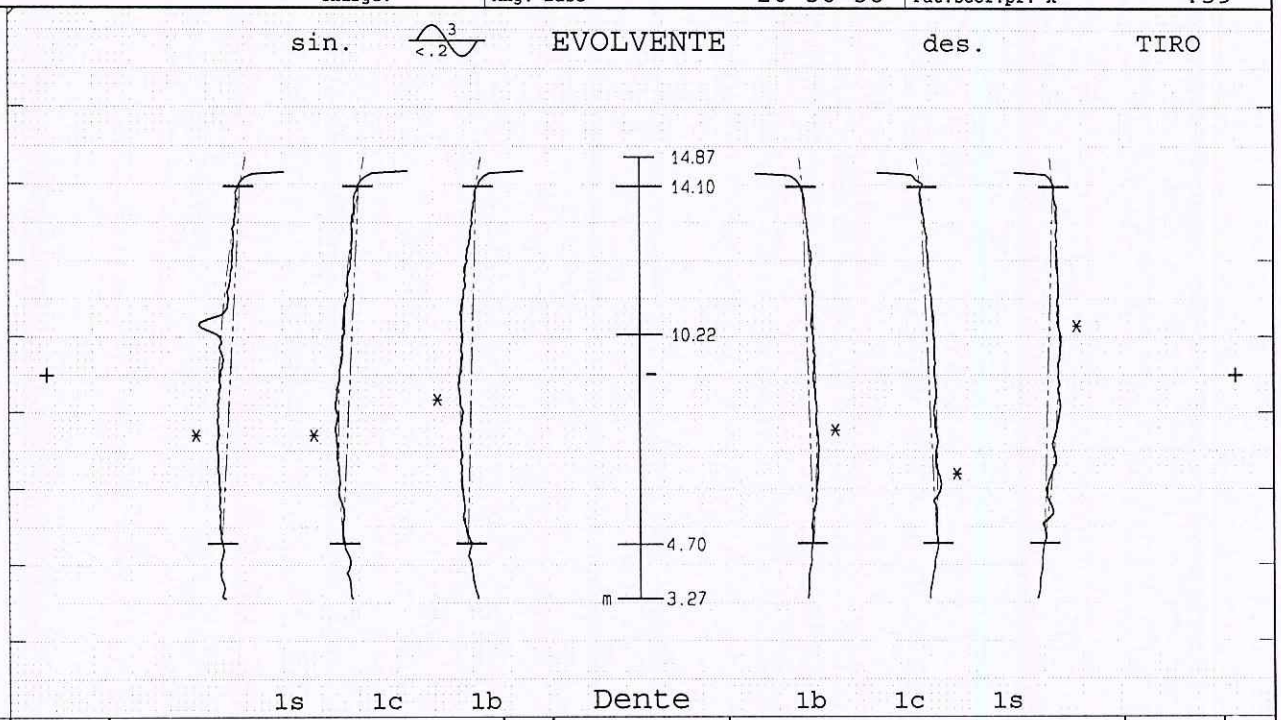
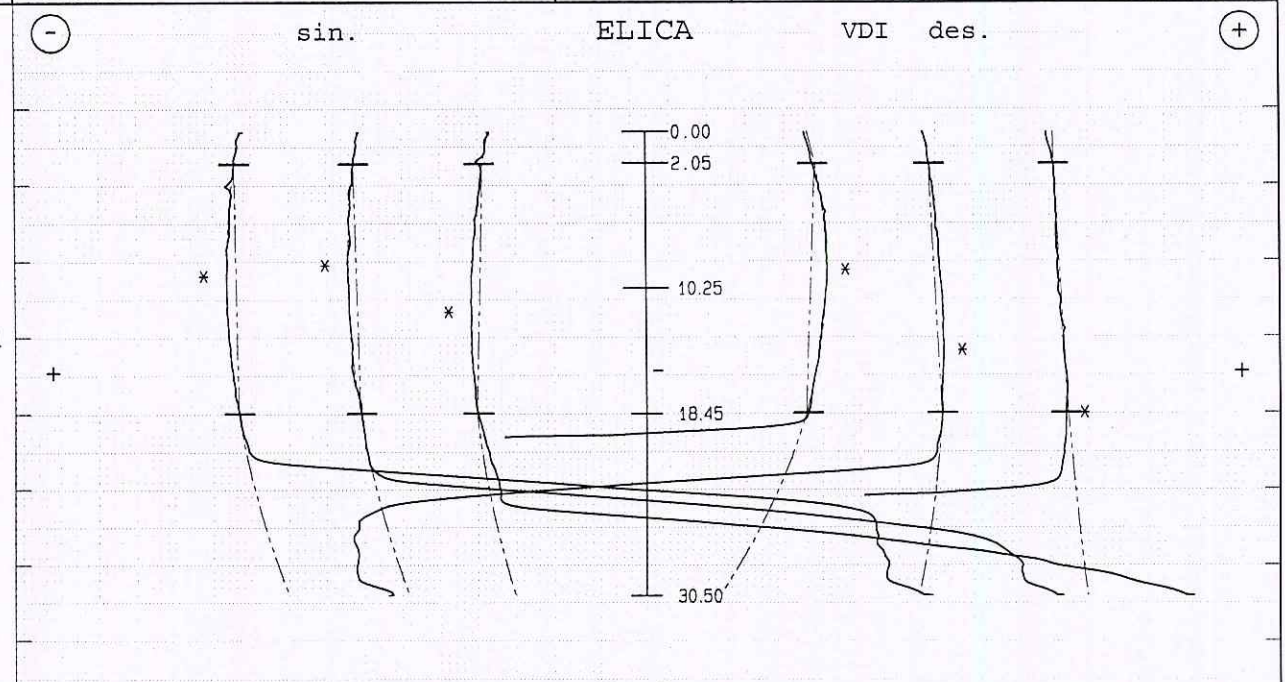
Ruota cilindrica Svergolamento

Nr. prog.: STI0412_06 0	P26 B7681	Controllore:	turno A	Data:	26.08.2017 08:20
Denominazione:	Input Outer Z21	Numero denti z	21	Largh.fasc.dent. b	30.5mm
Numero disegno.:	250.6.5216.35-IIF	Modulo m	2mm	Tratto evolv. La	9.4mm
Commessa/serie nr.:	4	Angolo pressione	20°00'00"	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formnext	Angolo elica	22°00'00"	Inizio elab. M1	4.7mm
Untersuchungszweck:	Laufende Messung	Ø Base db	42.1659mm	Palpatore Ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	20°36'38"	Fat.scor.pr. x	.39



Tolerance	Medio	Val.misur [µm]				Qual	Tolerance	Val.misur [µm]				Medio	Qual
		1s		1c	1b		Dente	1b		1c	1s		
fHαm ±6	-4	Var a 3					±6	Var a 6				-2	
fHα ±10	-4		-5	-4	-2		±10	-3	-4	2		-2	
Fα	7		10	6	5			5	6	5		5	
ffα 4	3		7	2	1		4	1	2	2		2	
Cα 0/4	3		3	3	3		0/4	2	2	3		2	
P/T-ø [mm]	40.020	[39.85/40.3]						51.390			[51.34/51.6]		



Tolerance	Medio	Val.misur [µm]				Qual	Tolerance	Val.misur [µm]				Medio	Qual
		1t		1c	1p		Dente	1p		1c	1t		
fHßm ±6	0	Var ß -3					±6	Var ß -8				-2	
fHß ±13	0		-1	-2	2		±13	3	-4	-5		-2	
Fß	3		3	3	2			4	3	4		4	
ffß 4	1		2	1	1		4	1	1	1		1	
Cß 1/5	2		2	2	2		1/5	4	2	0		2	
Bd 10±8	3						10±8					8	

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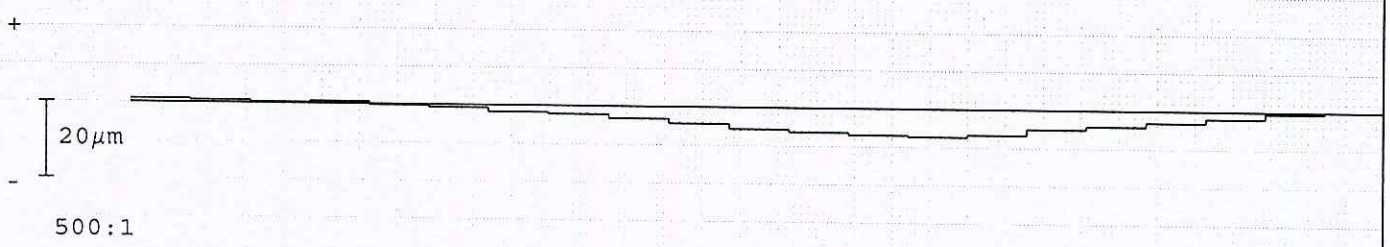
Ruota cilindrica Divisione

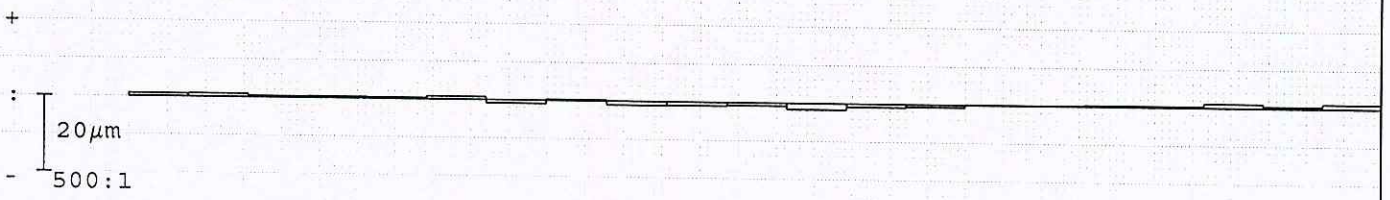
Nr. prog.: STI0412_06 0 P26 B7681	Controllore: turno A	Data:	26.08.2017 08:20
Denominazione: Input Outer Z21	Numero denti z 21	Angolo pressione	20°00'00"
Numero disegno.: 250.6.5216.35-IIF	Modulo m 2mm	Angolo elica	22°00'00"
Commessa/serie nr.: 4	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001 Spindel: Formnestl	Werkzeug:	Charge:	

Errori singoli di divisione fp fianco sinistro

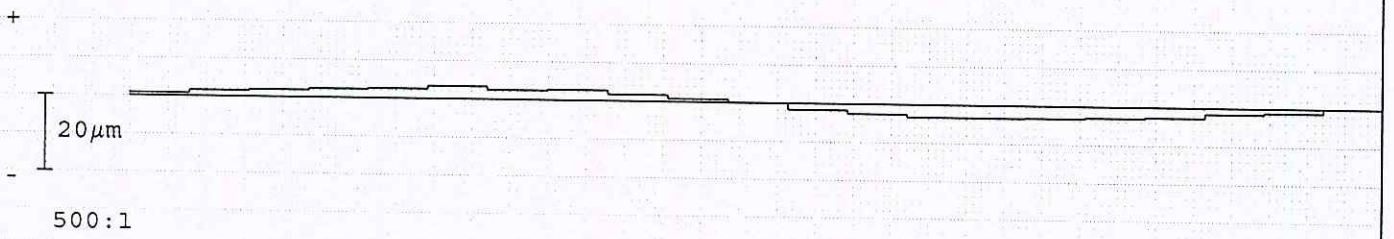
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



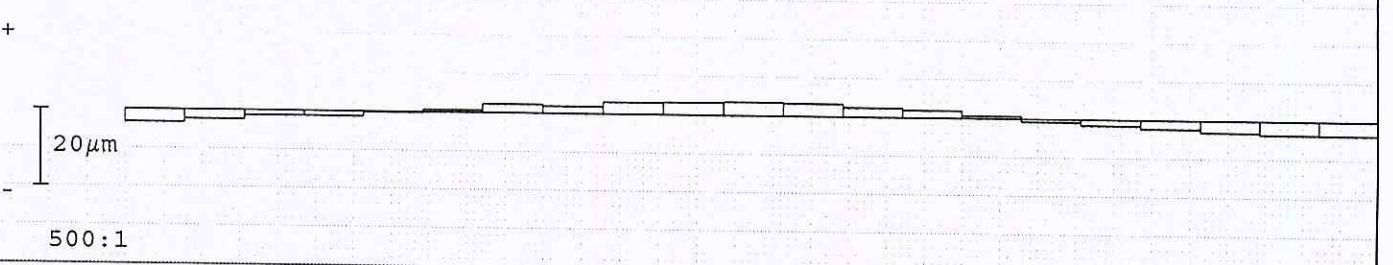
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:46.859 z=10.3mm

		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2		14		2		14	
Gr. salto di passo	fu max	1		18		2		18	
Scarto di divisione	Rp	3				3			
Err. globale di divisione	Fp	8		36		7		36	
Err. cordale di divisione	Fpz/8	4				3			

Centricità Fr (Ø-sfera =3.75mm) ◎ : 7µm



Err. di concentricitá	Fr	7	28	
Variaz. spessore dente	Rs			

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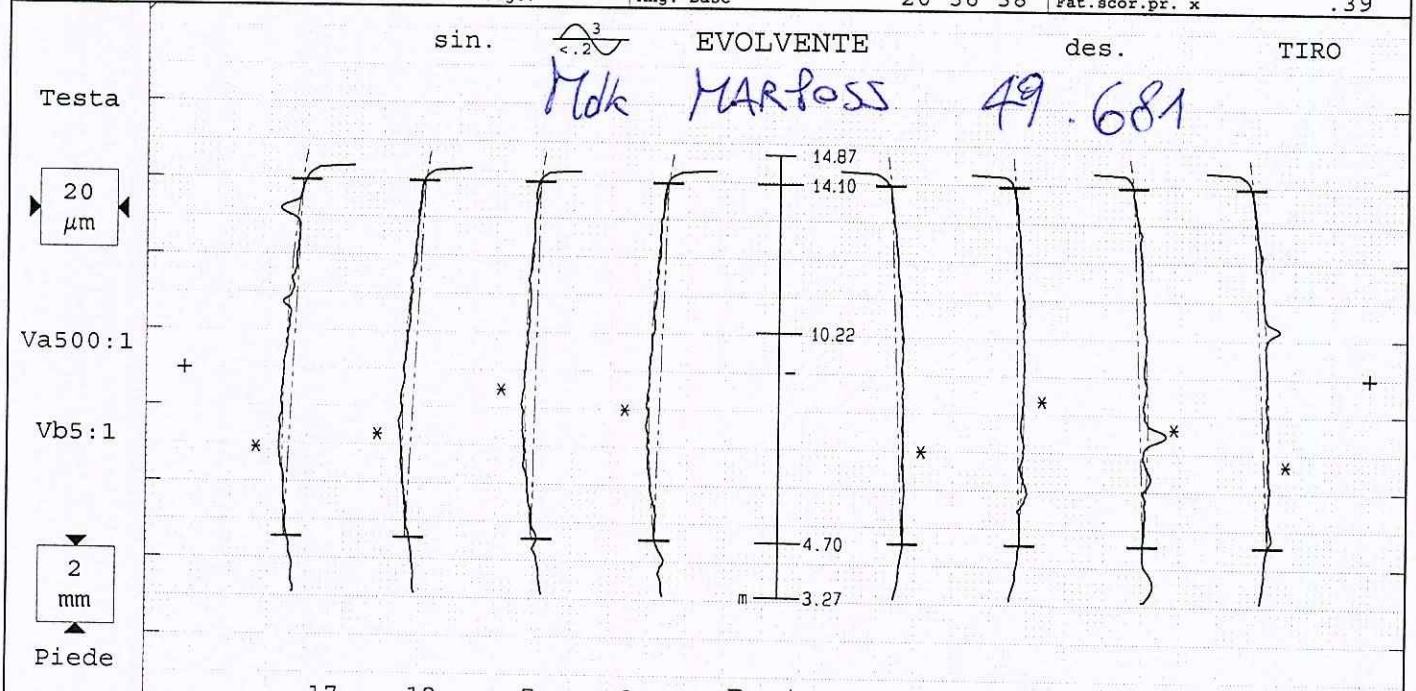
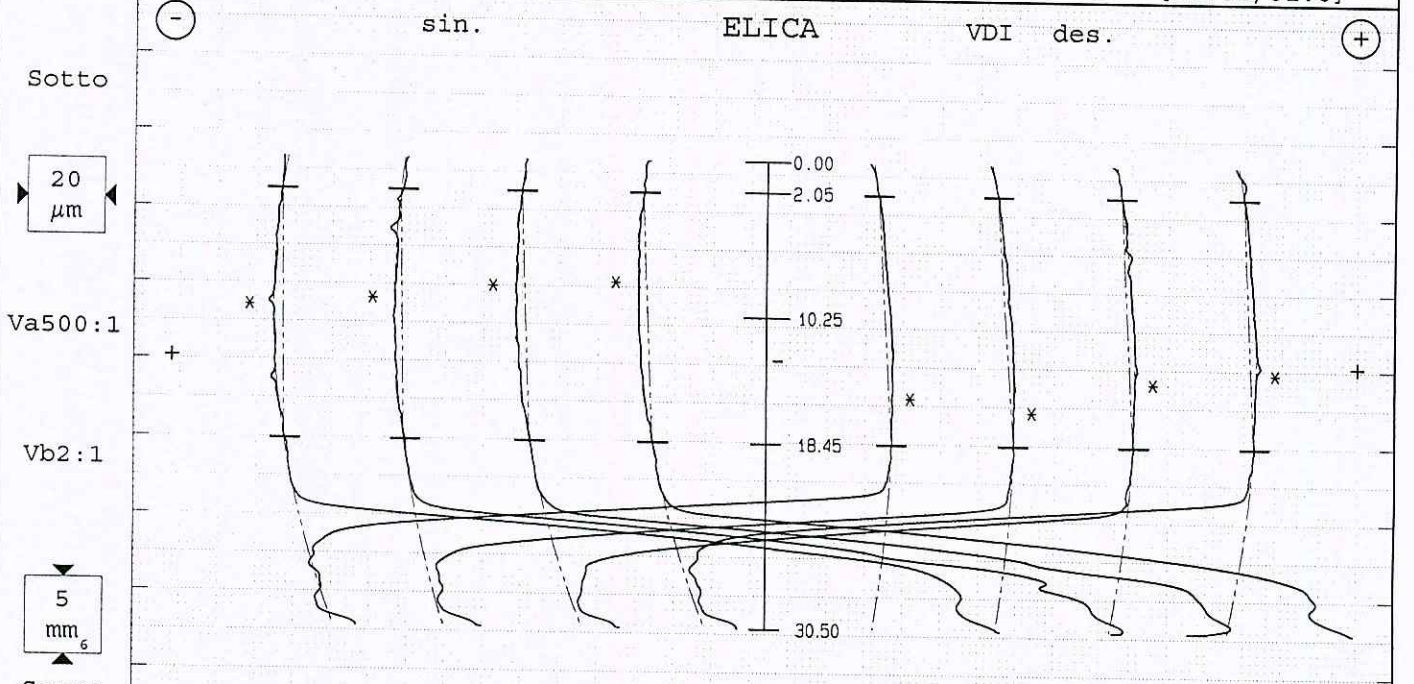
Docum.archiviato elettronicamente.Archiviazione cartacea non necessaria

Ruota cilindrica Evolvente/Elica

Nr. prog.:	STI0412_06 0 P26 B7681	Controllore:	turno A	Data:	26.08.2017 08:24
Denominazione:	Input Outer Z21	Numero denti z	21	Largh.fasc.dent. b	30.5mm
Numero disegno.:	250.6.5216.35-IIF	Modulo m	2mm	Tratto evolv. La	9.4mm
Commessa/serie nr.:	5	Angolo pressione	20°00'00"	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formnext	Angolo elica	22°00'00"	Inizio elab. M1	4.7mm
Untersuchungszweck:	Laufende Messung	Ø Base db	42.1659mm	Palpatore Ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	20°36'38"	Fat.scor.pr. x	.39



Tolerance	Medio	Val.misur [µm]				Qual	Tolerance	Val.misur [µm]				Medio	Qual
fHαm ±6	-4	Var a 3					±6	Var a 3				-3	
fHα ±10	-4	-4	-5	-2	-3		±10	-3	-1	-3	-4	-3	
Fα	6	7	6	5	5			4	4	9	8	6	
ffα 4	3	6	2	2	2		4	1	2	6	4	3	
Cα 0/4	3	2	3	3	3		0/4	2	2	2	2	2	
P/T-Ø [mm]	40.019	[39.85/40.3]						51.390			[51.34/51.6]		



fHßm ±6	-2	Var ß 2					±6	Var ß 2				-5
fHß ±13	-2	-1	-1	-3	-3		±13	-5	-6	-4	-4	-5
Fß	4	3	4	3	4			4	5	4	4	4
ffß 4	2	2	2	1	1		4	1	1	2	2	2
Cß 1/5	2	2	2	2	2							

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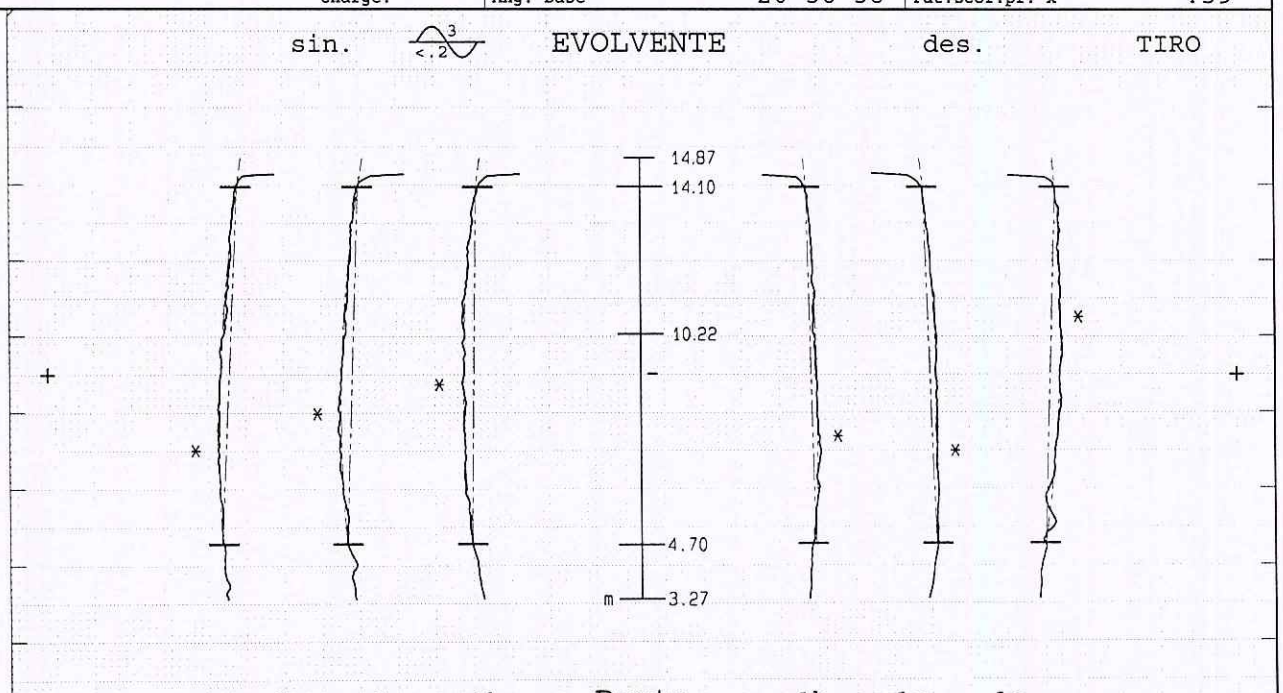
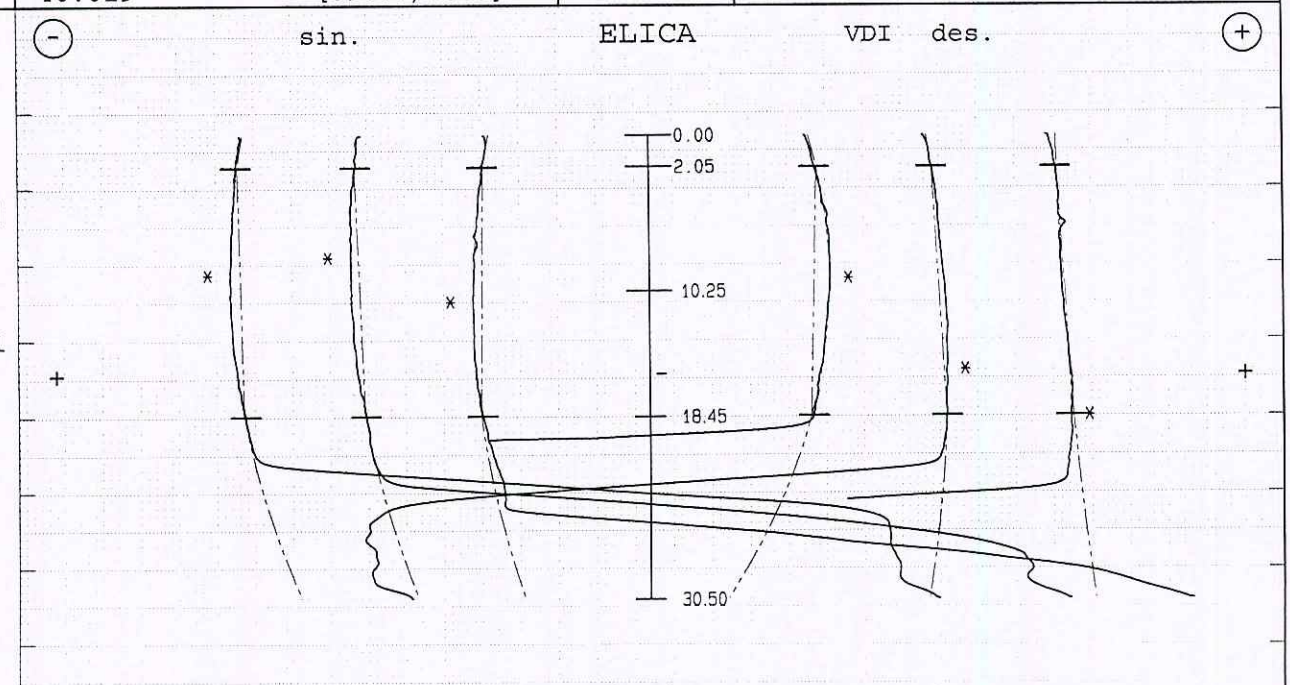
Ruota cilindrica Svergolamento

Nr. prog.: STI0412_06 0	P26 B7681	Controllore:	turno A	Data:	26.08.2017 08:24
Denominazione:	Input Outer Z21	Numero denti z	21	Largh.fasc.dent. b	30.5mm
Numero disegno.:	250.6.5216.35-IIF	Modulo m	2mm	Tratto evolv. La	9.4mm
Commessa/serie nr.:	5	Angolo pressione	20°00'00"	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formnext	Angolo elica	22°00'00"	Inizio elab. M1	4.7mm
Untersuchungszweck:	Laufende Messung	ø Base db	42.1659mm	Palpatore ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	20°36'38"	Fat.scor.pr. x	.39



Tolerance	Medio	Val.misur [µm]				Qual	Tolerance	Val.misur [µm]				Medio	Qual
		1s	1c	1b	Dente			1b	1c	1s			
fHαm ±6	-3	Var a 3					±6	Var a 6				-1	
fHα ±10	-3		-4	-3	-1		±10	-2	-3	3		-1	
Fα	5		5	5	4			4	4	5		4	
ffα 4	1		1	2	1		4	2	1	4		2	
Cα 0/4	3		2	3	3		0/4	1	2	3		2	
P/T-ø [mm]	40.019	[39.85/40.3]						51.390			[51.34/51.6]		



Tolerance	Medio	Val.misur [µm]				Qual	Tolerance	Val.misur [µm]				Medio	Qual
		1t	1c	1p	Dente			1p	1c	1t			
fHßm ±6	-1	Var ß -3					±6	Var ß -7				-3	
fHß ±13	-1		-2	-3	1		±13	2	-5	-5		-3	
Fß	3		3	4	2			4	4	4		4	
ffß 4	1		1	1	1		4	1	1	2		1	
Cß 1/5	2		3	2	2		1/5	4	1	-1		1	
Bd 10±8	3						10±8					7	

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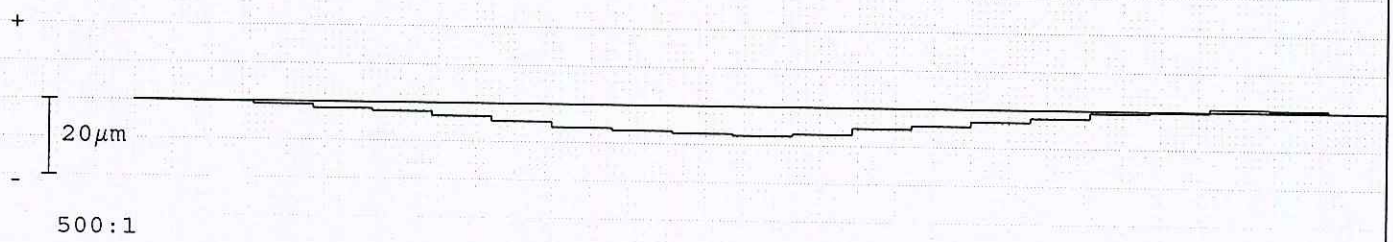
Ruota cilindrica Divisione

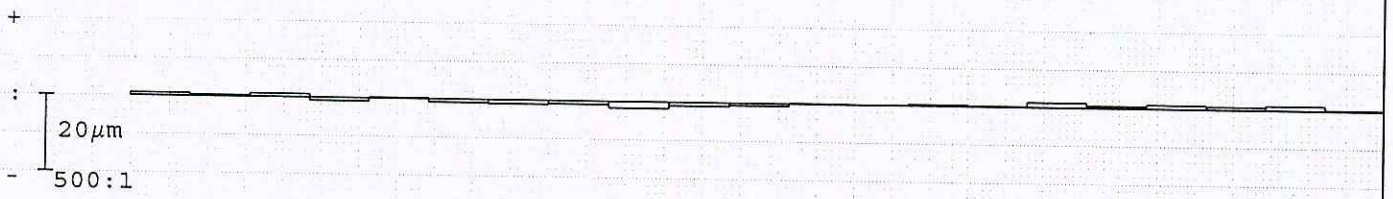
Nr. prog.: STI0412_06 0 P26 B7681	Controllore: turno A	Data:	26.08.2017 08:24
Denominazione: Input Outer Z21	Numero denti z 21	Angolo pressione	20°00'00"
Numero disegno.: 250.6.5216.35-IIF	Modulo m 2mm	Angolo elica	22°00'00"
Commessa/serie nr.: 5	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001 Spindel: Formmaat	Werkzeug:	Charge:	

Errori singoli di divisione fp fianco sinistro

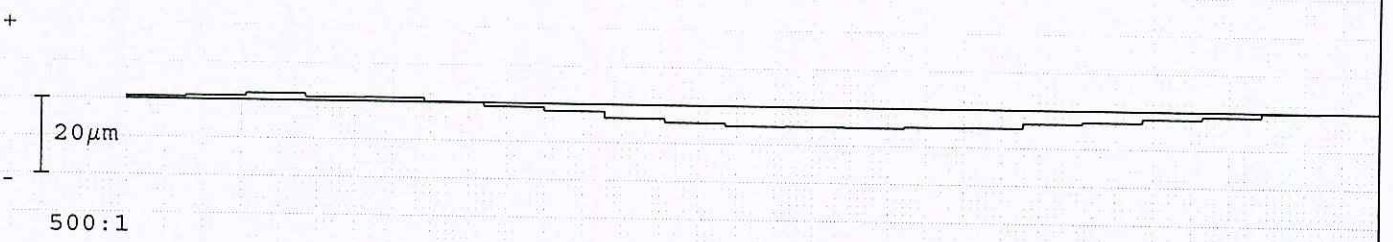
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



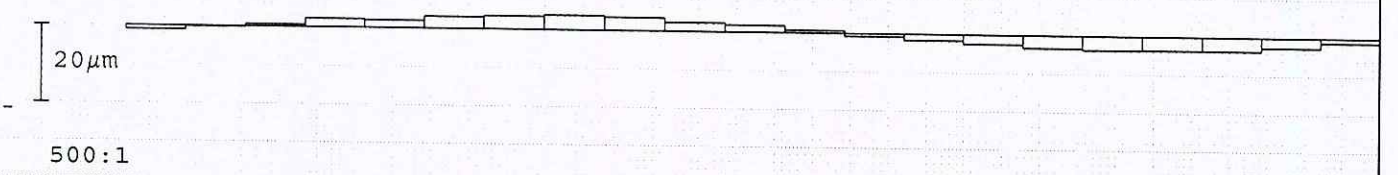
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:46.859 z=10.3mm

		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2		14		2		14	
Gr. salto di passo	fu max	1		18		2		18	
Scarto di divisione	Rp	3				3			
Err. globale di divisione	Fp	8		36		7		36	
Err. cordale di divisione	Fpz/8	4				4			

Centricità Fr (Ø-sfera =3.75mm) ◎ : 7µm



Err. di concentricitá	Fr	7	28	

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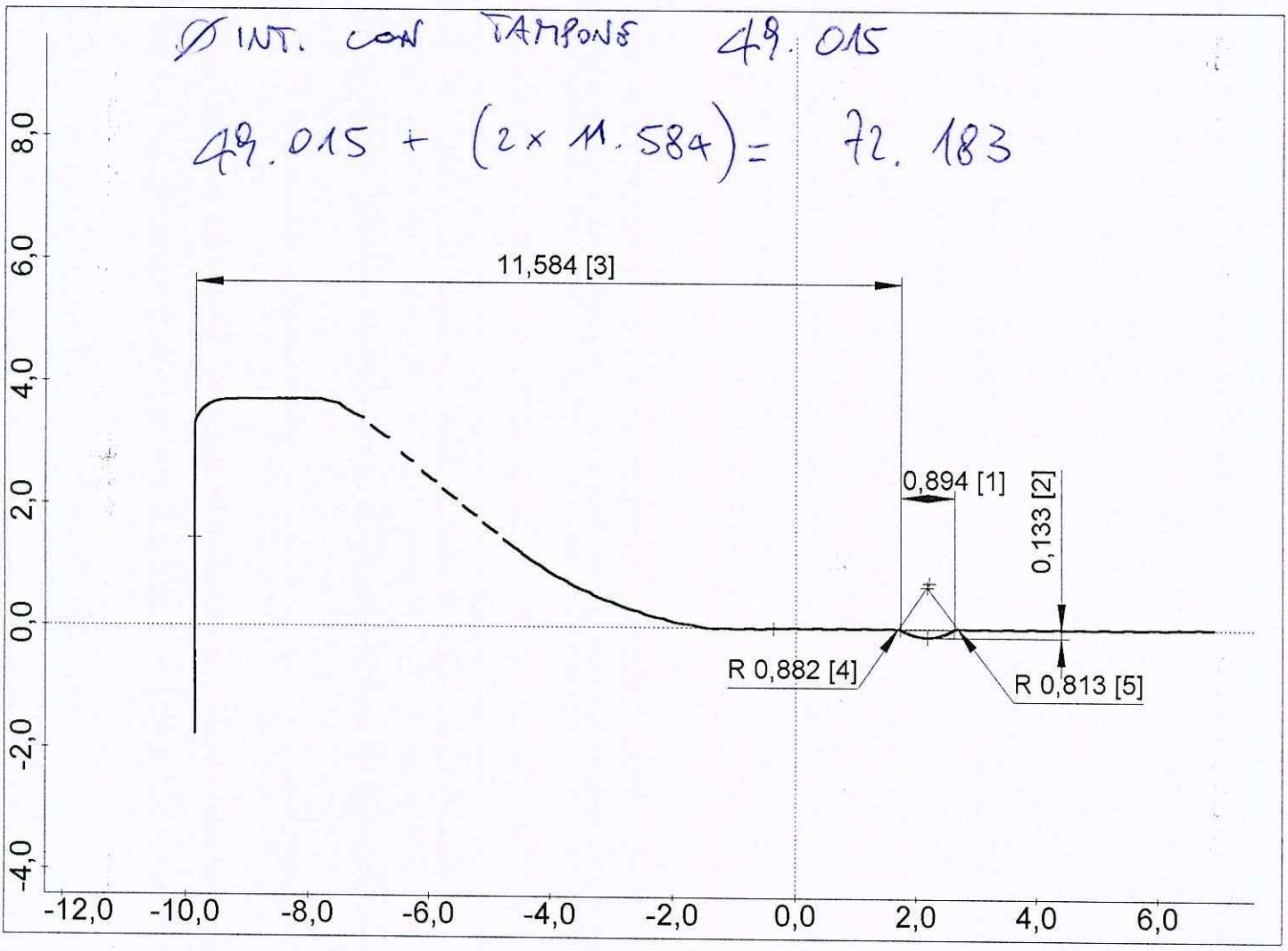
GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	IS 2
Numero:	5216
Operatore:	TURNO B
Data, ora:	26.08.2017, 12:58
Nota:	PROFILO N PZ N.1
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



PERTHOMETER CONCEPT

Area Riservata alla Produzione

Valutazione Profilo

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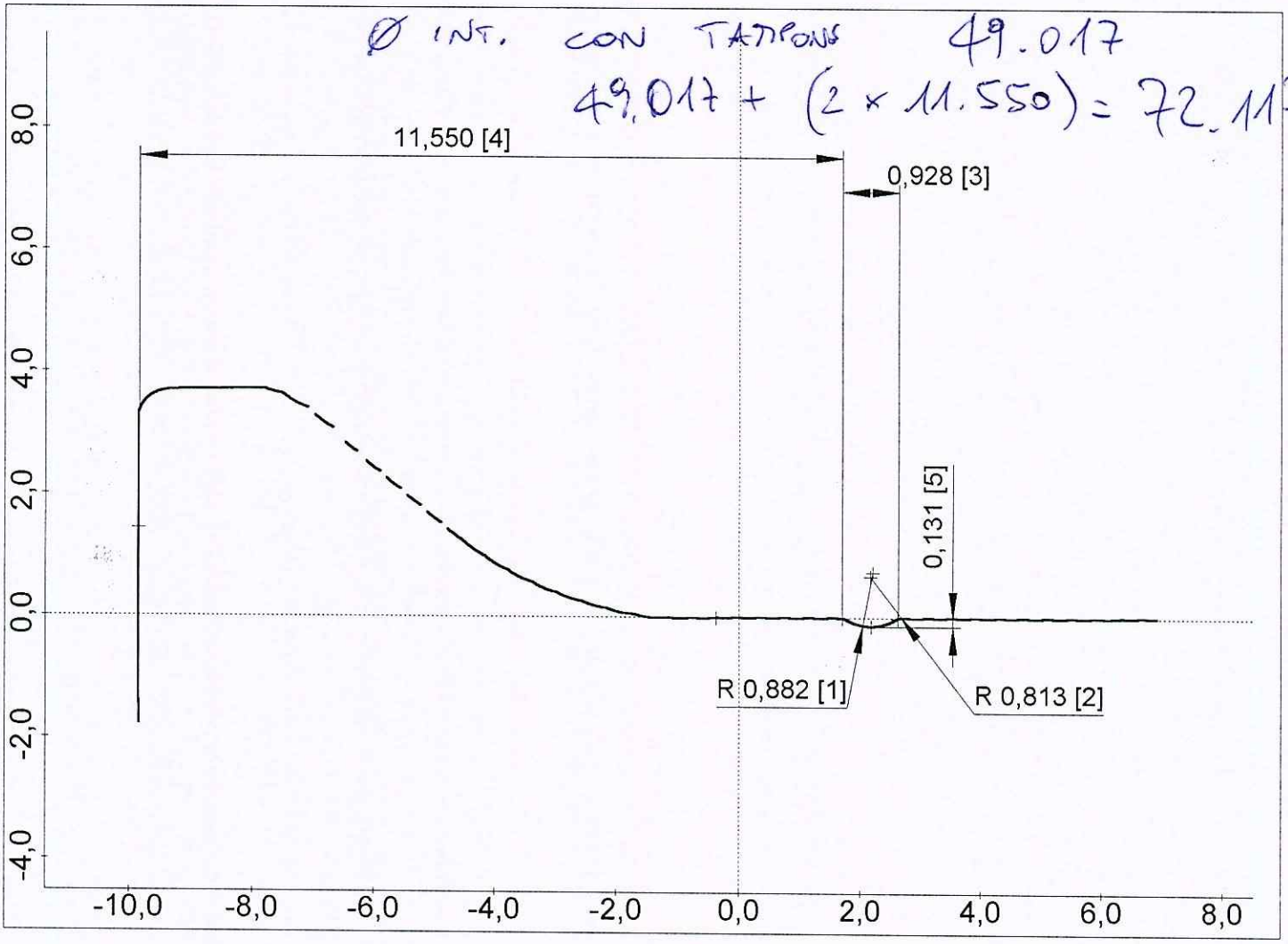
N°BADGE ODP RICEVENTE

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	IS 2
Numero:	5216
Operatore:	TURNO B
Data, ora:	26.08.2017, 12:58
Nota:	PROFILO N PZ N.2
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



PERTHOMETER CONCEPT

Area Riservata alla Produzione

Valutazione Profilo

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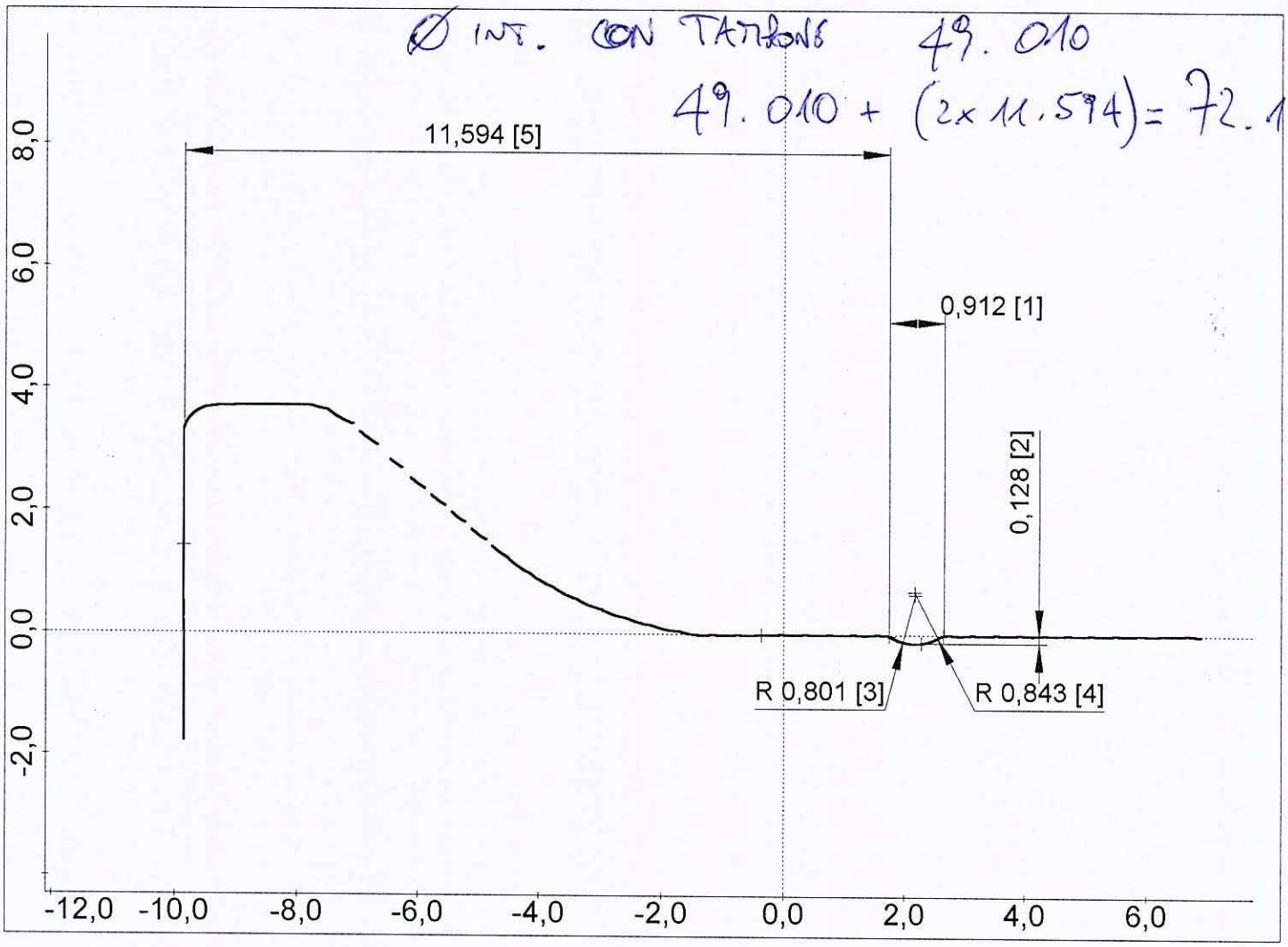
NOK ☐

N°BADGE ODP RICEVENTE

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	IS 2
Numero:	5216
Operatore:	TURNO B
Data, ora:	26.08.2017, 12:58
Nota:	PROFILO N PZ N.3
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



PERTHOMETER CONCEPT

Area Riservata alla Produzione

Valutazione Profilo

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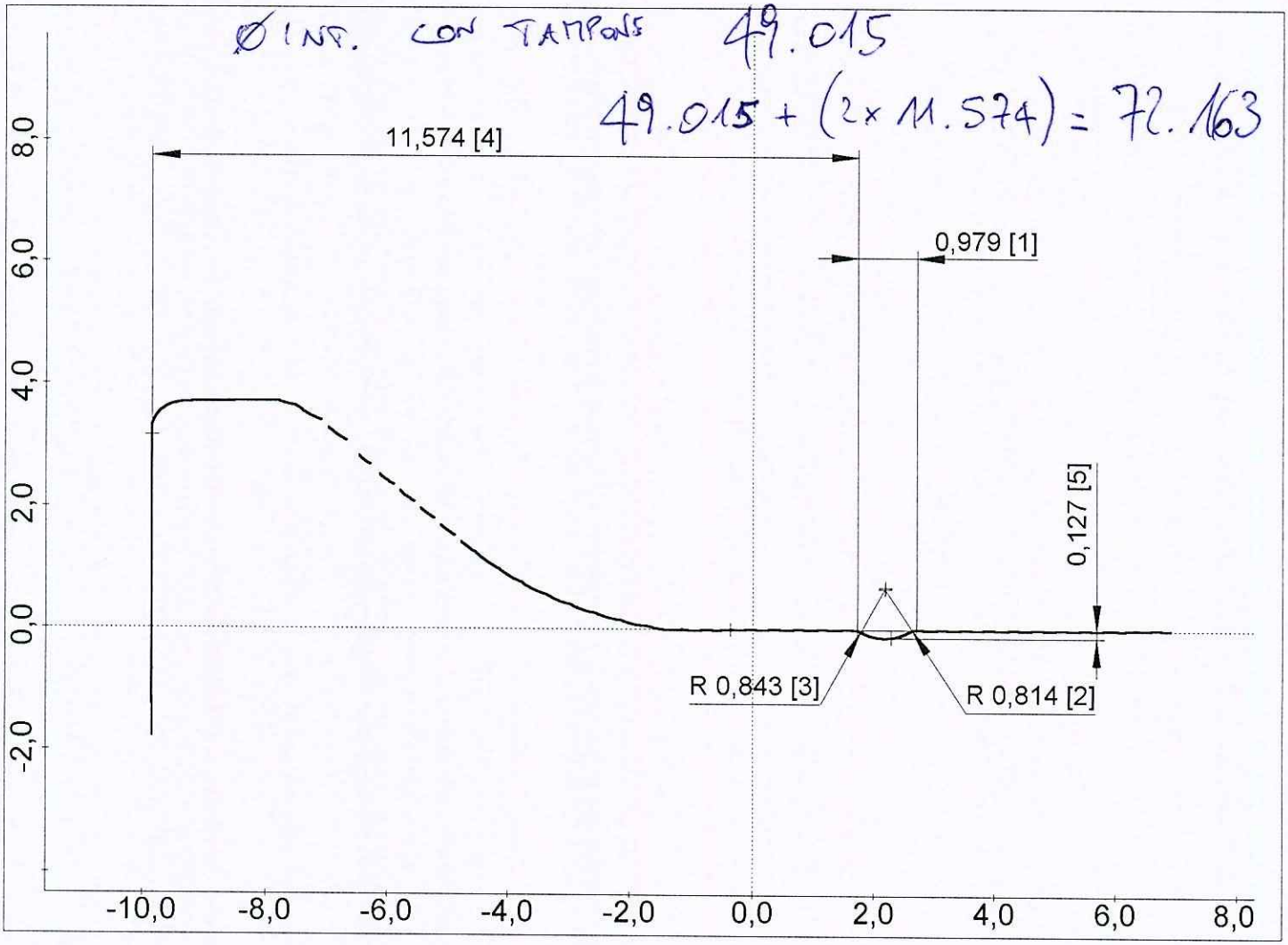
Via dei Ciclamini 4, Modugno (BA)

Oggetto:	IS 2
Numero:	5216
Operatore:	TURNO B
Data, ora:	26.08.2017, 12:58
Nota:	PROFILO N PZ N.4
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



PERTHOMETER CONCEPT

Area Riservata alla Produzione

Valutazione Profilo

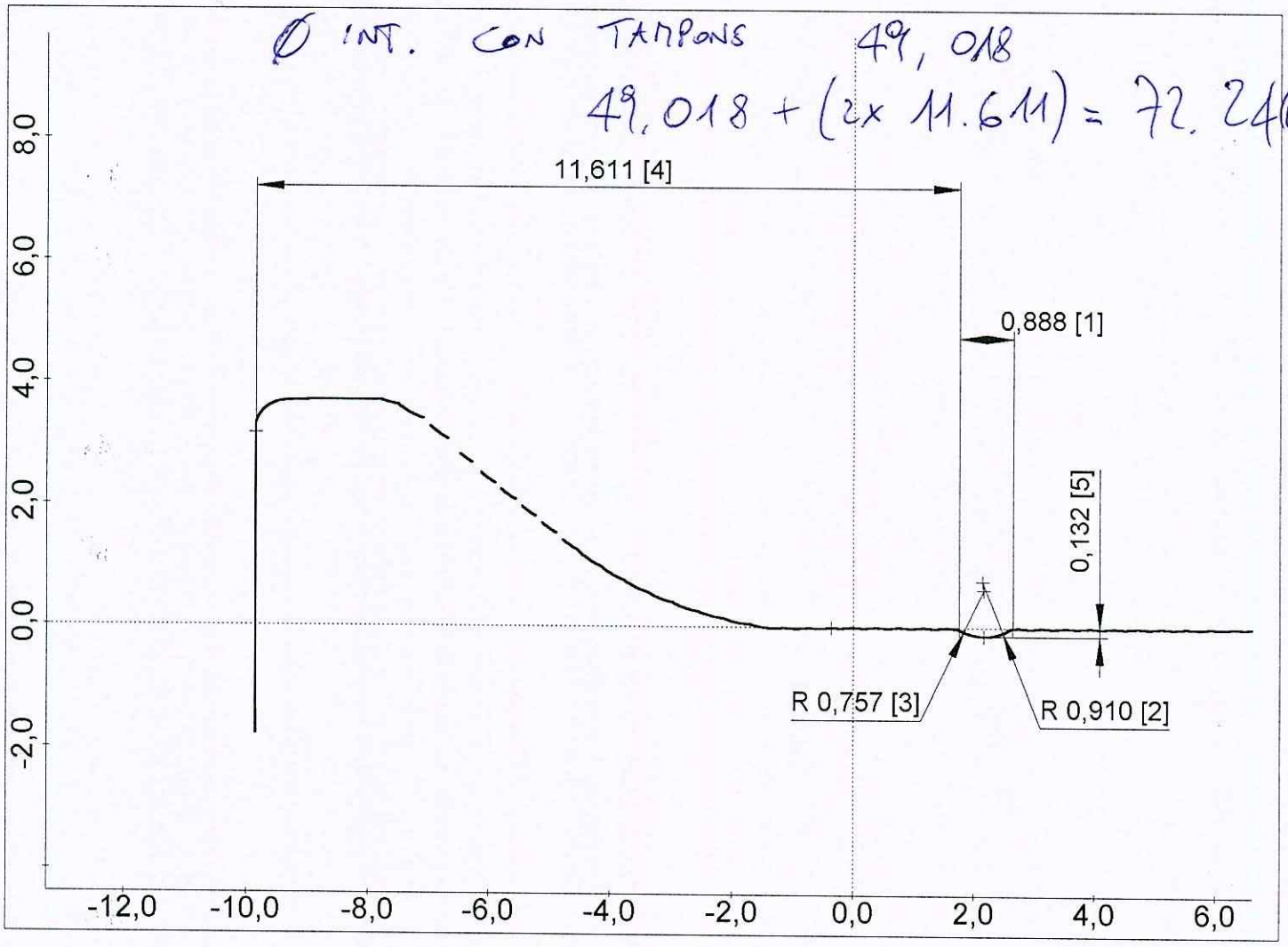
OK	☐
NOK	☐

N°BADGE ODP RICEVENTE

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	IS 2
Numero:	5216
Operatore:	TURNO B
Data, ora:	26.08.2017, 12:58
Nota:	PROFILO N PZ N.5
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



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Valutazione Profilo

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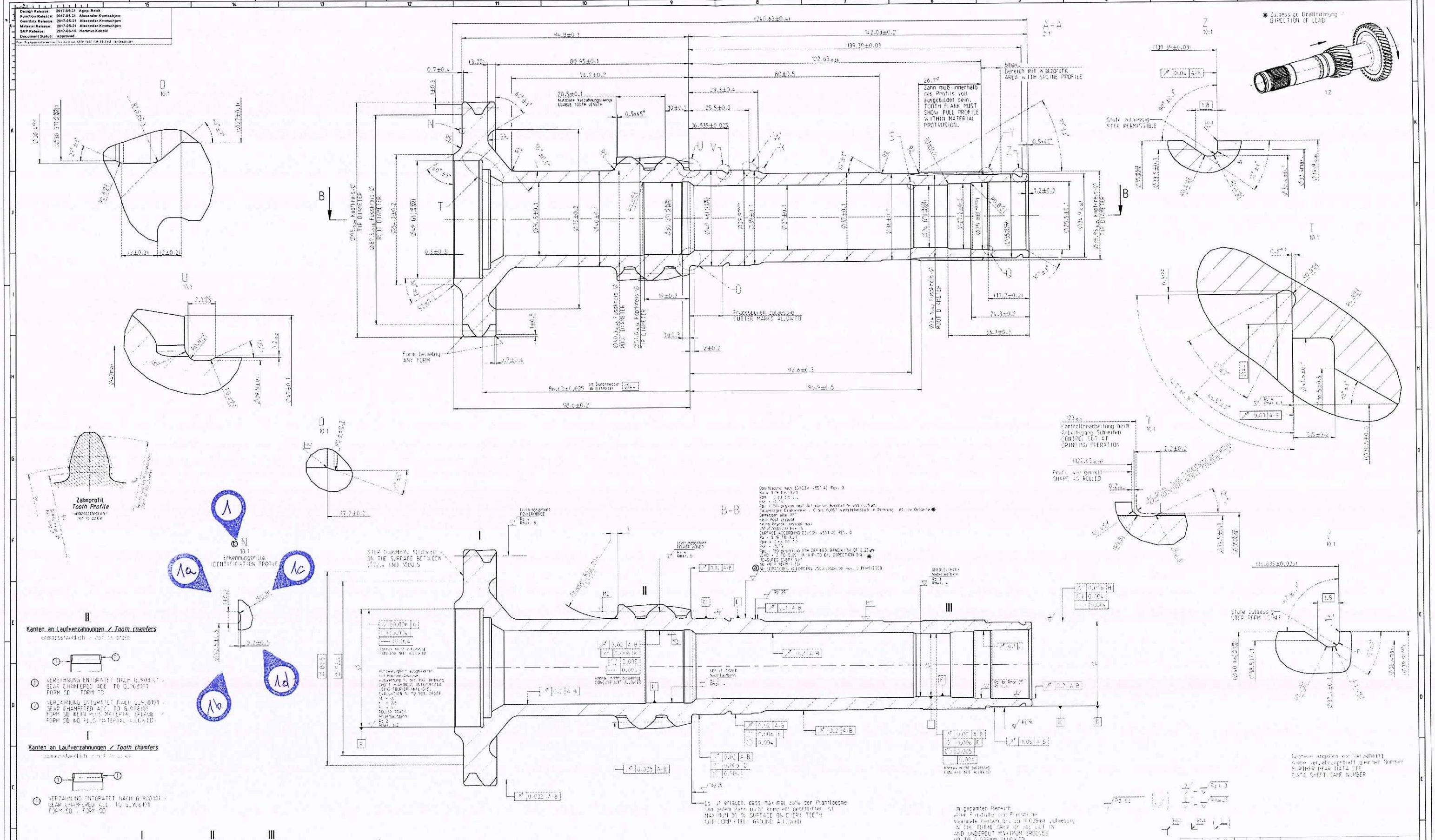
NOK ☐

N°BADGE ODP RICEVENTE

New P/N introduction - 5616 instead 5176.36	
Short description:	New Z21 microgeometry

	PPAP Requirements	Required	Note for ind. "b"	PPAP Docs updated
1	Design Records	Yes		Yes
2	Authorized Engineering change documents	Yes	see dwg	Yes
3	Customer Engineering approval	n.a.		
4	DFMEA	NO		
5	Process flow diagram(s)	NO		
6	PFMEA	Yes		Yes
7	Control plan	Yes		Yes
8	Measurement system analysis studies	NO		
9	Dimensional results	Yes		Yes
10	Records of Material / Performance test results	NO		
11	Initial process studies	NO		
12	Qualified laboratory documentation	NO		
13	Appearance Approval Report (A.A.R.)	n.a.		
14	Sample Production Parts	Yes		Yes
15	Master sample	Yes		Yes
16	Checking aids	n.a.		
17	Customer-Specific Requirements	NO		
18	Part Submission Warrant (PSW)	Yes		Yes

	Other requirements			
1	PSW Raw part	NO		
2	PSW E.P. part	NO		
3	PSW Engagement Rings	NO		

Design Release:	2017-05-31	Agop.Reidt
Function Release:	2017-05-31	Alexander.Kvartschjov
Geardata Release:	2017-05-31	Alexander.Kvartschjov
Material Release:	2017-05-31	Alexander.Kvartschjov
SAP Release:	2017-06-16	Hartmut.Kobold
Document Status:	approved	

Zur Fertigstellung siehe Hartmut KOPFNOTE FÜR FERTIGUNG INFORMATION